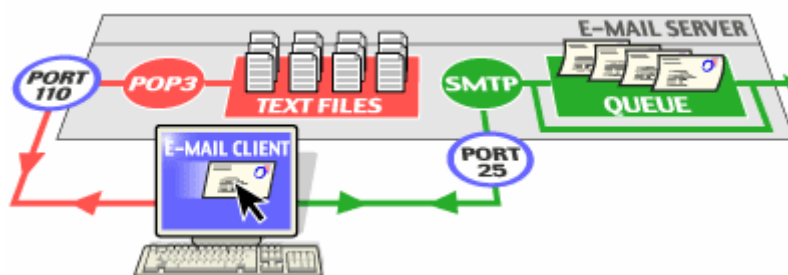


THE REAL E-MAIL SYSTEM

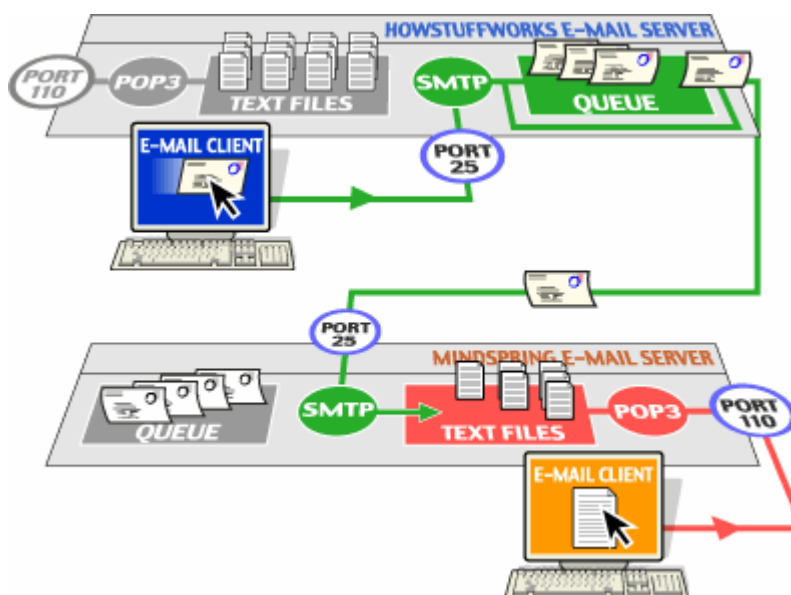
For the vast majority of people right now, the real e-mail system consists of two different servers running on a server machine. One is called the SMTP server, where SMTP stands for Simple Mail Transfer Protocol. The SMTP server handles outgoing mail. The other is either a POP3 server or an IMAP server, both of which handle incoming mail. POP stands for Post Office Protocol, and IMAP stands for Internet Mail Access Protocol. A typical e-mail server looks like this:



The SMTP server listens on well-known port number 25, POP3 listens on port 110 and IMAP uses port 143. And, if you are really concerned about all that you are in the wrong place or you should be teaching the class!

THE SMTP SERVER

Whenever you send a piece of e-mail, your e-mail client, Microsoft Outlook, interacts with the SMTP server to handle the sending. The SMTP server on your host may have conversations with other SMTP servers to actually deliver the e-mail.



Let's assume that I want to send a piece of e-mail. My e-mail ID is brain, and I have my account on howstuffworks.com. I want to send e-mail to jsmith@mindspring.com. I am using a stand-alone e-mail client like Outlook or Outlook Express.

When I set up my account I told Outlook the name of the mail server – you have to know the name of the mail server at your Internet Service Provider. For the following example the mail server is mail.howstuffworks.com. In some cases the Incoming Mail Server (POP3) and the Outgoing Mail Server (SMTP) may have the same name. In others the server names can be different. If you use Verizon, your POP3 server is likely named incoming.verizon.net and your SMTP server is named outgoing.verizon.net.

When I compose a message and press the Send button, here is what happens:

Outlook connects to the SMTP server at mail.howstuffworks.com using port 25.

Outlook has a conversation with the SMTP server, telling the SMTP server the address of the sender and the address of the recipient, as well as the body of the message.

The SMTP server takes the "to" address (jsmith@mindspring.com) and breaks it into two parts:

- The recipient name (jsmith)

- The domain name (mindspring.com)

If the "to" address had been another user at howstuffworks.com, the SMTP server would simply hand the message to the POP3 server for howstuffworks.com (using a little program called the delivery agent). Since the recipient is at another domain, SMTP needs to communicate with that domain.

The SMTP server has a conversation with a Domain Name Server, or DNS. A DNS for our purposes is simply a map computers on the Internet use to find other computers on the internet. It says, "Can you give me the IP address of the SMTP server for mindspring.com?" The DNS replies with the one or more IP addresses for the SMTP server(s) that Mindspring operates.

The SMTP server at howstuffworks.com connects with the SMTP server at Mindspring using port 25. It has the same simple text conversation that my e-mail client had with the SMTP server for HowStuffWorks, and gives the message to the Mindspring server. The Mindspring server recognizes that the domain name for jsmith is at Mindspring, so it hands the message to Mindspring's POP3 server, which puts the message in jsmith's mailbox.

If, for some reason, the SMTP server at HowStuffWorks cannot connect with the SMTP server at Mindspring, then the message goes into a queue. The SMTP server on most machines uses a program called sendmail to do the actual sending, so this queue is called the sendmail queue. Sendmail will periodically try to resend the messages in its queue. For example, it might retry every 15 minutes. After four hours, it will usually send you a piece of mail that tells you there is some sort of problem. After five days, most sendmail configurations give up and return the mail to you undelivered.

The actual conversation that an e-mail client has with an SMTP server is incredibly simple and human readable. It is specified in public documents called Requests For Comments (RFC), and a typical conversation looks something like this:

```
helo test
250 mx1.mindspring.com Hello abc.sample.com
[220.57.69.37], pleased to meet you
mail from: test@sample.com
250 2.1.0 test@sample.com... Sender ok
rcpt to: jsmith@mindspring.com
250 2.1.5 jsmith... Recipient ok
data
354 Enter mail, end with "." on a line by itself
from: test@sample.com
to:jsmith@mindspring.com
subject: testing
John, I am testing...
.
250 2.0.0 e1NMajH24604 Message accepted
for delivery
quit
221 2.0.0 mx1.mindspring.com closing connection
Connection closed by foreign host.
```

What the e-mail client says is in blue, and what the SMTP server replies is in black. The e-mail client introduces itself, indicates the "from" and "to" addresses, delivers the body of the message and then quits. You can, in fact, telnet to a mail server machine at port 25 and have one of these dialogs yourself -- this is one method people use to "spoof" e-mail.

You can see that the SMTP server understands very simple text commands like HELO, MAIL, RCPT and DATA. The most common commands are:

```
HELO - introduce yourself
EHLO - introduce yourself and request extended mode
MAIL FROM: - specify the sender
RCPT TO: - specify the recipient
DATA - specify the body of the message (To:, From: and Subject: should be the
first three lines.)
RSET - reset
QUIT - quit the session
HELP - get help on commands
VRFY - verify an address
EXPN - expand an address
VERB - verbose
```

THE POP SERVER

In the simplest implementations of POP3, the server really does maintain a collection of text files -- one for each e-mail account. When a message arrives, the POP3 server simply appends it to the bottom of the recipient's file!

When you check your e-mail, your e-mail client connects to the POP3 server using port 110. The POP3 server requires an account name and a password. Once you have logged in, the POP3 server opens your text file and allows you to access it. Like the SMTP server, the POP3 server understands a very simple set of text commands. Here are the most common commands:

- USER enter your user ID
- PASS enter your password
- QUIT quit the POP3 server
- LIST list the messages and their size
- RETR retrieve a message, pass it a message number
- DELE delete a message, pass it a message number
- TOP show the top x lines of a message, pass it a message number and the number of lines

Your e-mail client connects to the POP3 server and issues a series of commands to bring copies of your e-mail messages to your local machine. Generally, it will then delete the messages from the server

You can see that the POP3 server simply acts as an interface between the e-mail client and the text file containing your messages. And again, you can see that the POP3 server is extremely simple!

As you can see, the POP3 protocol is very simple. It allows you to have a collection of messages stored in a text file on the server. Your e-mail client (e.g. Outlook) can connect to your POP3 e-mail server and download the messages from the POP3 text file onto your PC. That is about all that you can do with POP3.

THE IMAP SERVER – AND OTHERS

As I mentioned above, there are primarily two kinds of email servers for incoming messages. Your internet service provider determines what protocol they are going to support and you should understand if you are connecting to an IMAP or a POP server. But, there are some other mail servers you may come across. I am not going to go into any detail on these but they are Exchange and HTTP mail servers. If you use an internal email system on a local area network your mail server is likely an Exchange server. Hotmail is an example of an HTTP mail server.

Many users want to do far more than what a POP mail server supports with their e-mail, and they want their e-mail to remain on the server. The main reason for keeping your e-mail on the server is to allow users to connect from a variety of machines. With POP3, once you download your e-mail it exists only on the machine to which you downloaded it.

If you want to read your e-mail both on your desktop machine and your laptop POP3 makes life difficult.

IMAP (Internet Mail Access Protocol) is a more advanced protocol that solves these problems. With IMAP, your mail stays on the e-mail server. You can organize your mail into folders, and all the folders live on the server as well. When you search your e-mail, the search occurs on the server machine, rather than on your machine. This approach makes it extremely easy for you to access your e-mail from any machine, and regardless of which machine you use, you have access to all of your mail in all of your folders.

Your e-mail client connects to the IMAP server using port 143. The e-mail client then issues a set of text commands that allow it to do things like list all the folders on the server, list all the message headers in a folder, get a specific e-mail message from the server, delete messages on the server or search through all of the e-mails on the server.

One problem that can arise with IMAP involves this simple question: "If all of my e-mail is stored on the server, then how can I read my mail if I am not connected to the Internet?" To solve this problem, most e-mail clients have some way to cache e-mail on the local machine. For example, the client will download all the messages and store their complete contents on the local machine (just like it would if it were talking to a POP3 server). The messages still exist on the IMAP server, but you now have copies on your machine. This allows you to read and reply to e-mail even if you have no connection to the Internet. The next time you establish a connection, you download all the new messages you received while disconnected and send all the mail that you wrote while disconnected.

ATTACHMENTS

Your e-mail client allows you to add attachments to e-mail messages you send, and also lets you save attachments from messages that you receive. Attachments might include word processing documents, spreadsheets, sound files, snapshots and pieces of software. Usually, an attachment is not text (if it were, you would simply include it in the body of the message). Since e-mail messages can contain only text information, and attachments are not text, there is a problem that needs to be solved.

In the early days of e-mail, you solved this problem by hand, using a program called uuencode. The uuencode program assumes that the file contains binary information. It extracts 3 bytes from the binary file and converts them to four text characters (that is, it takes 6 bits at a time, adds 32 to the value of the 6 bits and creates a text. What uuencode produces, therefore, is an encoded version of the original binary file that contains only text characters. In the early days of e-mail, you would run uuencode yourself and paste the uuencoded file into your e-mail message.

Here is typical output from the uuencode program:

```
begin 644 reports
M9W)E<" B<&P_(B O=F%R+VQO9R]H='1P9"]W96(V-C1F-
BYA8V-E<W,N;&]GM('P@8W5T("UF(#(@+60@(C\B('P@8W5T
```

```
(\"UF(#$@+60@(B8B(#X@<V5A<F-HM+61A=&$M)#$*?B]C;
W5N=\"UP86=E<R!\\(''-O<G0@/B!S=&%T<RTD,0IC<
\" @M?B]W96)S:71E+V-G:2UB:6XO<W5G9V5S=\"UD871A+V1A=
&$@<W5G9V5S=\"TDM,0IC<\"!^+W=E8G-l=&4O8V=l+6)I;B
]W:&5R92UD871A+V1A=&$@=VAE<F4MM)#$*8W @?B]W96)S:7
1E+V-G:2UB:6XO96UA:6QE<BUD871A+V1A=&$@96UAL:6PM)#
$*?B]G971L;V<@/B!L;V=S+20Q\"GXO=&]T86P@/B!T;W1A;\"T
D,0IA
End
```

The recipient would then save the uuencoded portion of the message to a file and run uuencode on it to translate it back to binary. The word "reports" in the first line tells uuencode what to name the output file

Modern e-mail clients are doing exactly the same thing, but they run uuencode and uuencode for you automatically. If you look at a raw e-mail file that contains attachments, you'll find that the attachment is represented in the same uuencoded text format shown above!

Considering its tremendous impact on society, having forever changed the way we communicate, today's e-mail system is one of the simplest things ever devised! There are parts of the system, like the routing rules in sendmail, that get complicated, but the basic system is incredibly straightforward.

The next time you send an e-mail, you'll know exactly how it's getting to its destination.

ACCOUNT SETUP (POP, POP3)

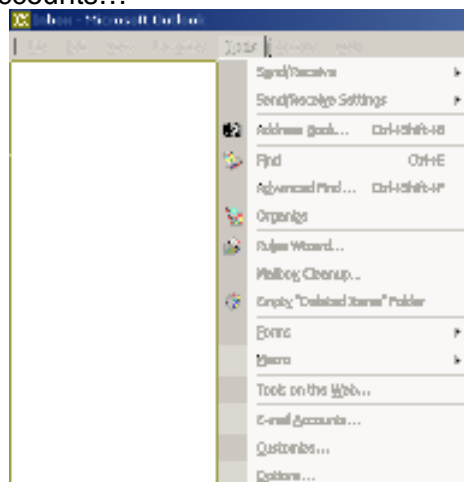
So far we have talked about email servers. Outlook is an email client. Email servers process the mail and an email client is a user-friendly interface for reading, writing and organizing email. You need an email client such as Outlook because I am not going to tell you how to telnet to an email server and you don't want to!

Typically you will have an email account provided by your Internet Service Provider. For example, if you have an internet connection provided by Verizon you will have an email account such as SamIAm@Verizon.net. If you have an internet connection provided by Charter you will have an email account such as SamIAm@Charter.net. Your Internet Service Provider likely provides a web-based email client or method for you to access your email without using Outlook.

So, why would I want to complicate things by teaching you how to use Outlook as your email client? Besides providing other functions for managing your calendar and address book Outlook also provides a common interface for your email and lets you create folders and "agents" so you can organize your email. An agent will automatically move any email I receive from tom@ns.sympatico.ca from my Inbox to a folder I setup called "VIPMail" because when I get email from my Dad I don't want it to get buried among the other email I get.

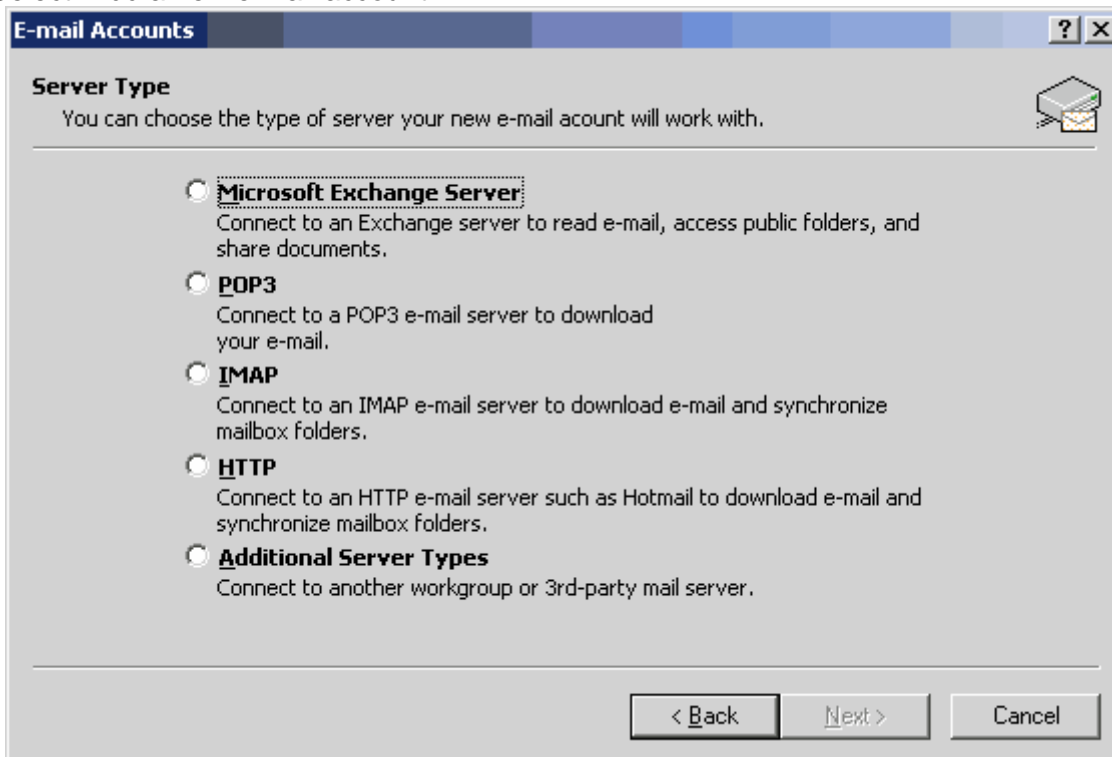
You may also want to have a common interface for your email if you use more than one email provider and have more than one email account. You can receive all of the email from all of your email accounts directly into Outlook's Inbox. Or, if you change email providers you won't have to learn a new email client – you configure Outlook to retrieve you email from your new service provider's mail server and sending and receiving your new email will be the same as with your old email.

So, let's set up Outlook to send/receive our email from our POP mail account. Under the Tools tab, select E-Mail Accounts...





Select "Add a new e-mail account"...



Then "POP3"...

E-mail Accounts

Internet E-mail Settings (POP3)

Each of these settings are required to get your e-mail account working.

User Information

Your Name:

E-mail Address:

Server Information

Incoming mail server (POP3):

Outgoing mail server (SMTP):

Logon Information

User Name:

Password:

☒ Remember password

☐ Log on using Secure Password Authentication (SPA)

Test Settings

After filling out the information on this screen, we recommend you test your account by clicking the button below. (Requires network connection)

And you are ready to provide Outlook with the information it needs to send and retrieve your email.

User Information

Your name: This is the sender information most recipient email clients will display.

E-mail Address: This is your email address.

Server Information

Incoming mail server: This is the name of your Internet Service Provider's POP mail server which handles the mail you receive.

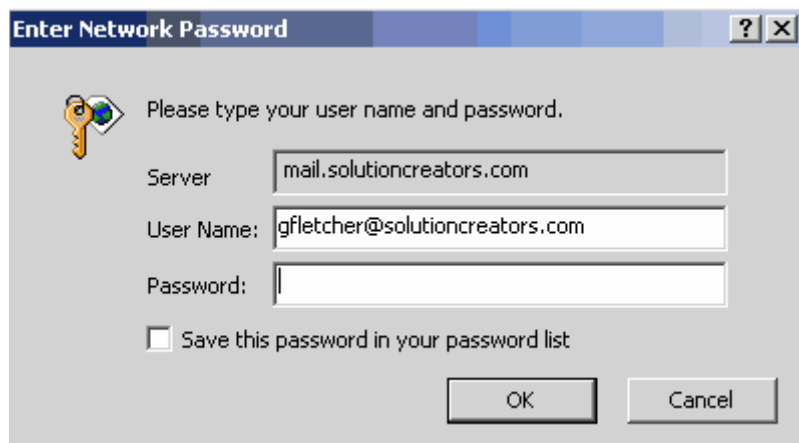
Outgoing mail server: This is the name of your Internet Service Provider's SMTP mail server which handles the mail you send.

Logon Information

User Name: When you get an account with an Internet Service Provider you are assigned a User Name and Password. In many cases your User Name is the same as your email address.

Password:

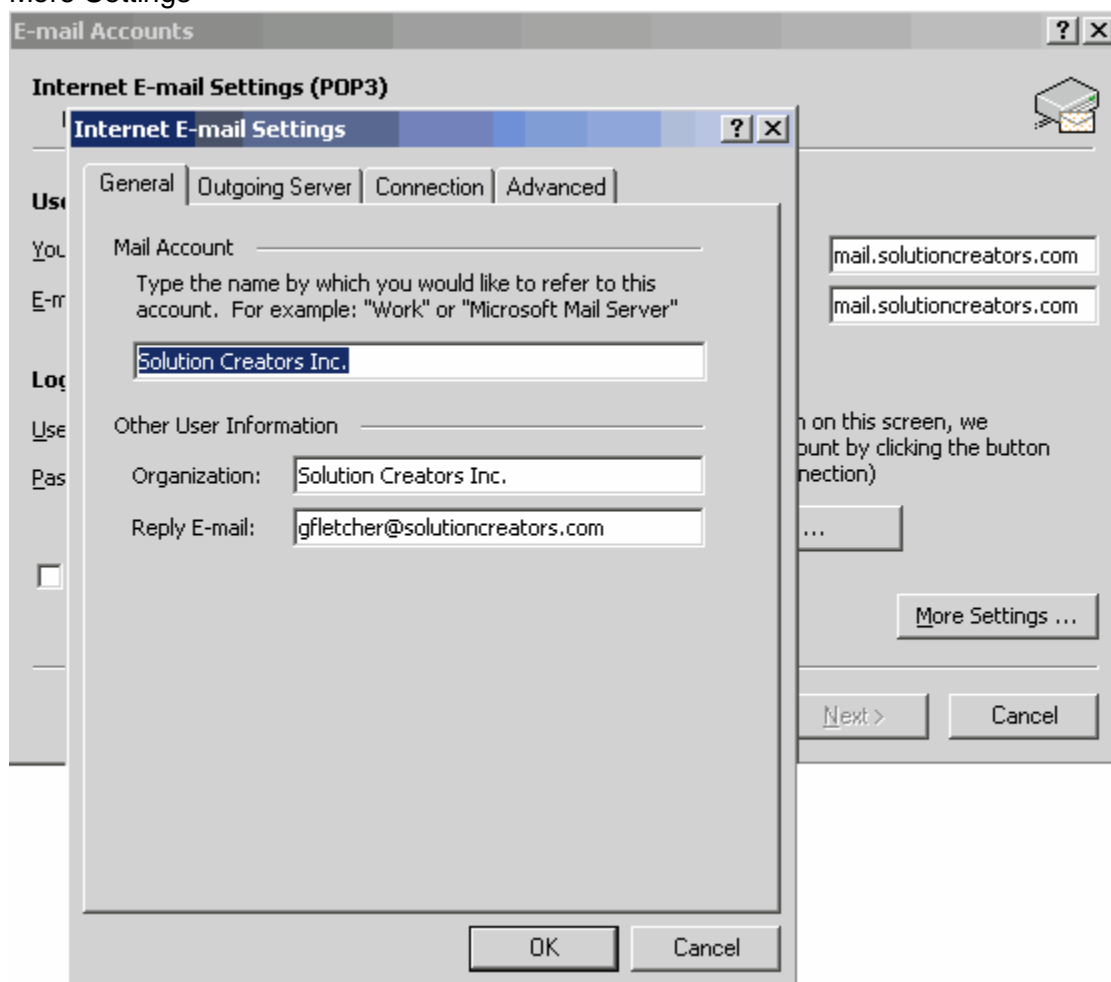
Remember password Make sure this is checked. Otherwise whenever you send or receive email you will be prompted to provide your password.



The 'Enter Network Password' dialog box is shown. It has a title bar with a question mark and a close button. The main area contains a key icon and the text 'Please type your user name and password.' Below this are three text boxes: 'Server' with 'mail.solutioncreators.com', 'User Name' with 'gfletcher@solutioncreators.com', and 'Password' which is empty. There is a checkbox labeled 'Save this password in your password list' which is unchecked. At the bottom are 'OK' and 'Cancel' buttons.

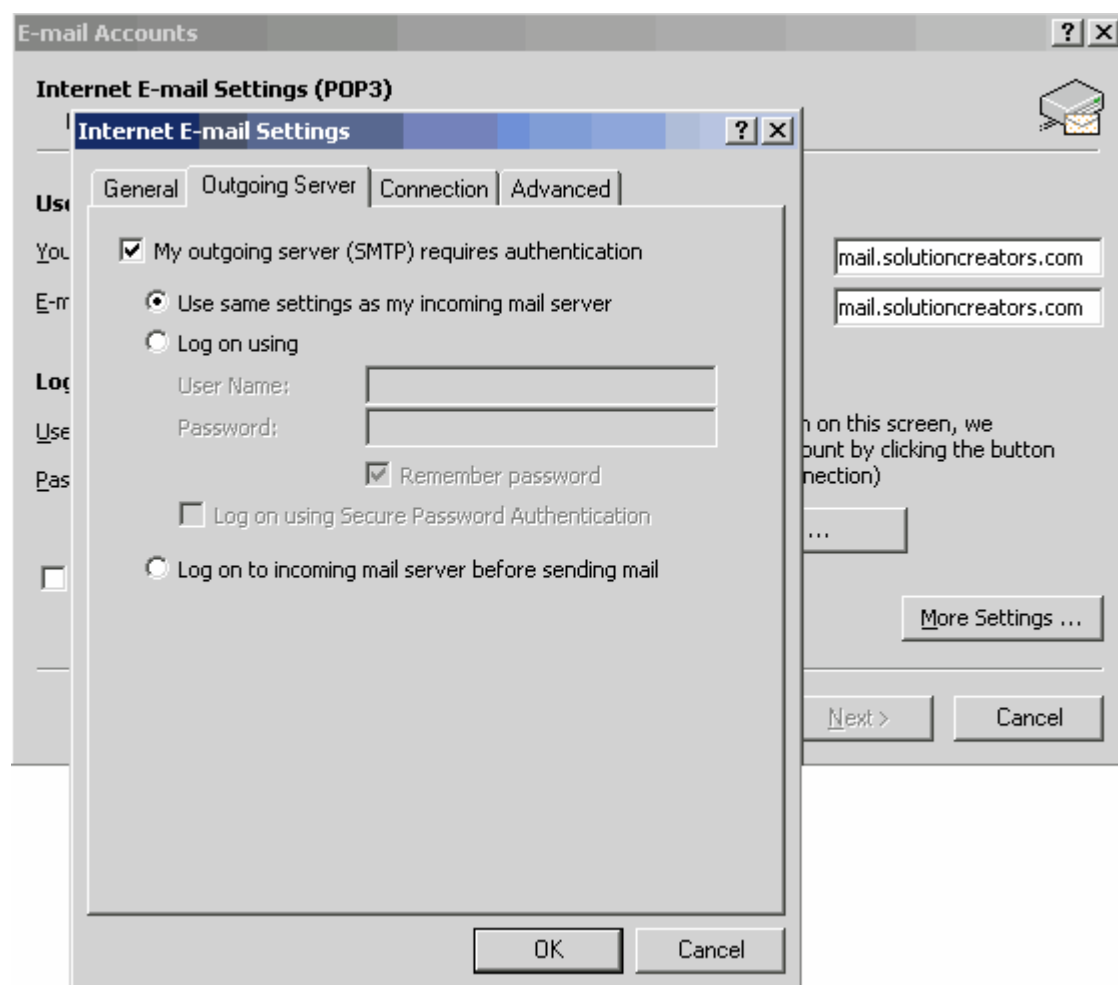
Ligon using Secure Password Authentication (SPA) should not be checked unless your email provider specifically tells you to turn this on.

More Settings

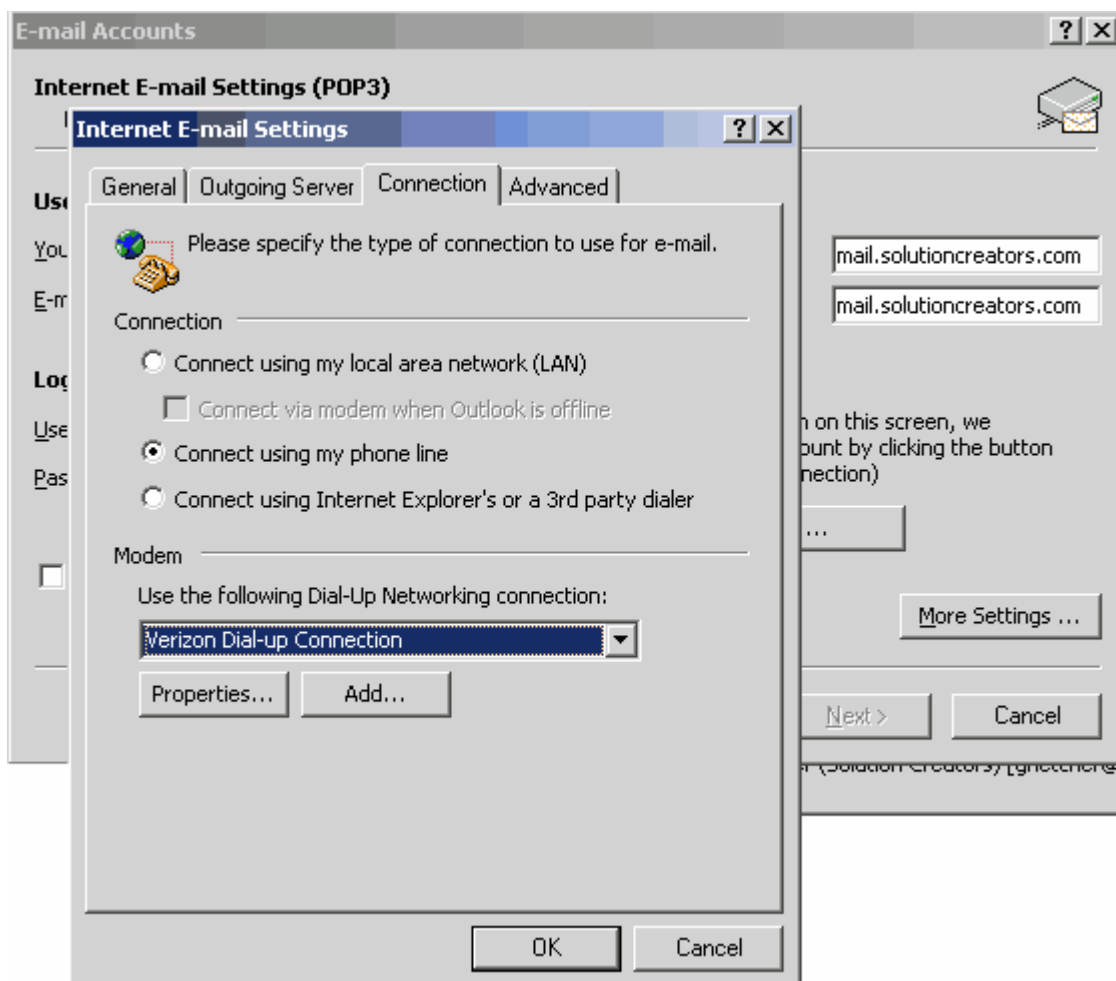


The 'E-mail Accounts' dialog box is shown, with the 'Internet E-mail Settings (POP3)' sub-dialog open. The sub-dialog has tabs for 'General', 'Outgoing Server', 'Connection', and 'Advanced'. The 'General' tab is selected. It contains a 'Mail Account' section with a text box containing 'Solution Creators Inc.' and a description: 'Type the name by which you would like to refer to this account. For example: "Work" or "Microsoft Mail Server"'. Below this is an 'Other User Information' section with 'Organization' set to 'Solution Creators Inc.' and 'Reply E-mail' set to 'gfletcher@solutioncreators.com'. The sub-dialog has 'OK' and 'Cancel' buttons. The main dialog box has a 'More Settings ...' button and 'Next >' and 'Cancel' buttons.

General Tab provides information used to organize your email accounts and some optional header information used when sending email.

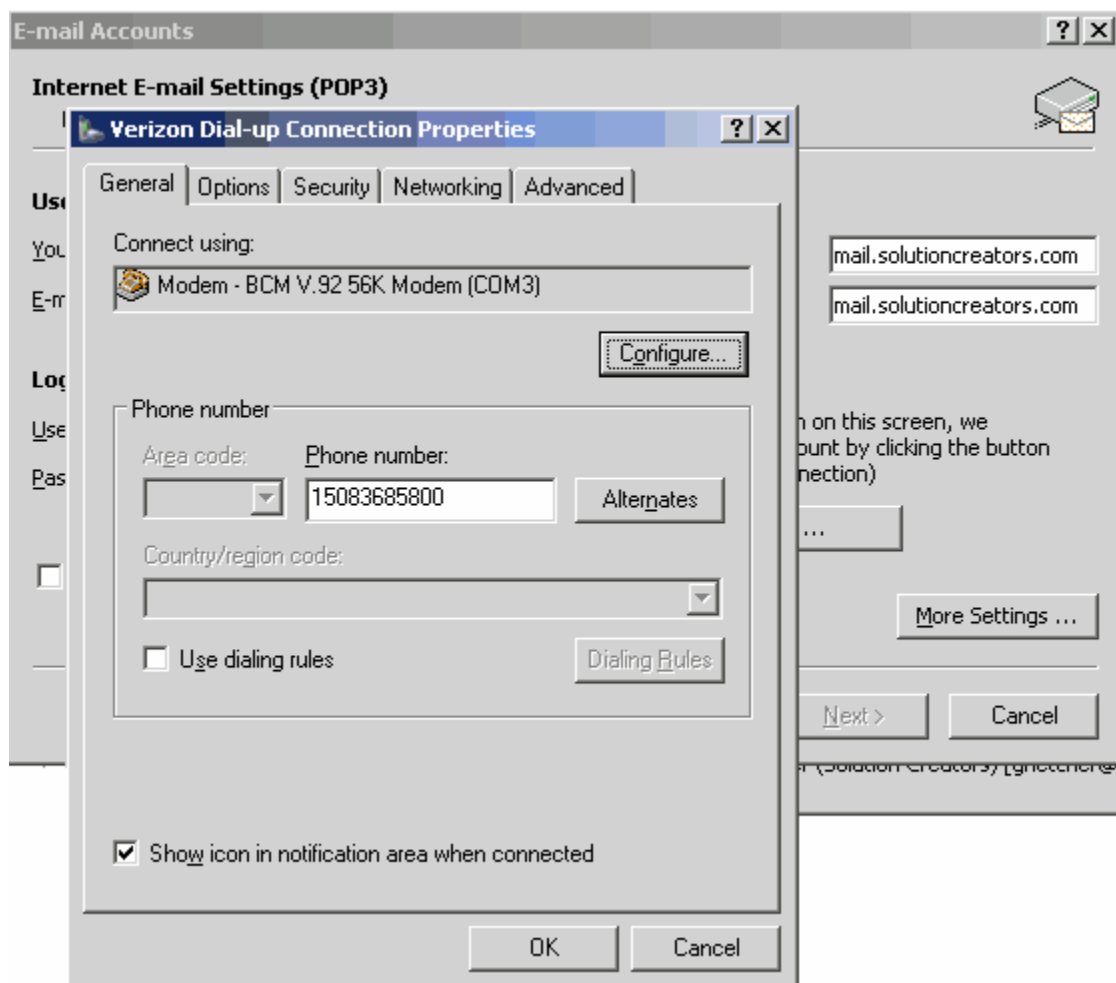


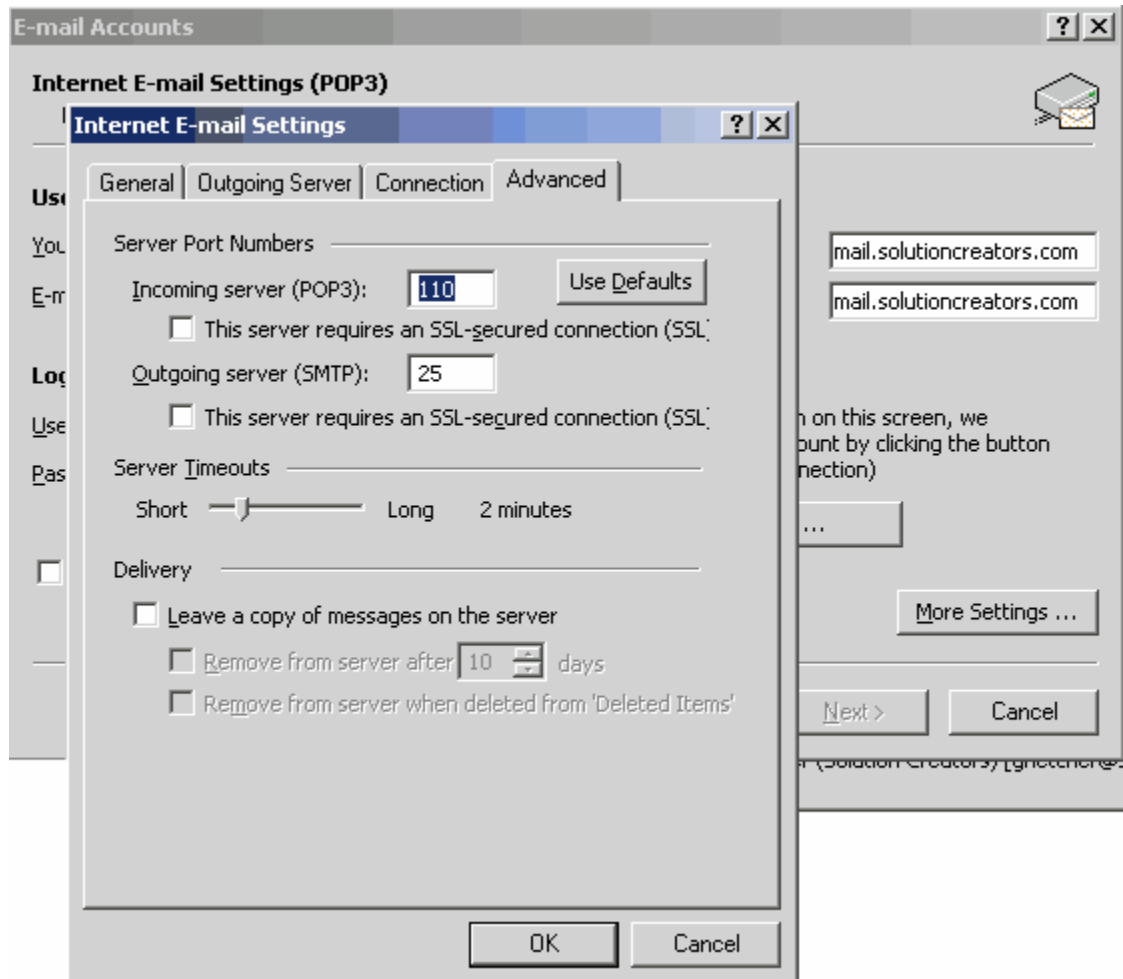
Outgoing Server Tab. Most email providers require you to logon and provide a password to send email. If everyone did you would get a lot less spam. If your email provider does then you need to provide some information to Outlook to make that happen. Typically your logon information to send email will be the same as you use to receive email.



Connection Tab provides information for Outlook to connect to your email provider. If you have a DSL or Broadband connection and the cable or cord from the wall is connected to a router or hub and there is more than one computer in your household which connects to the Internet at the same time you have a local area network (LAN).

You may have a DSL or Broadband connection without a router or hub. In this case the cable or cord from the wall will be connected directly to a computer and only that computer can connect to the Internet. You have to configure this in Outlook by selecting which connection to use. You may also need to further configure the connection.





The Advanced Tab.

CHARTER

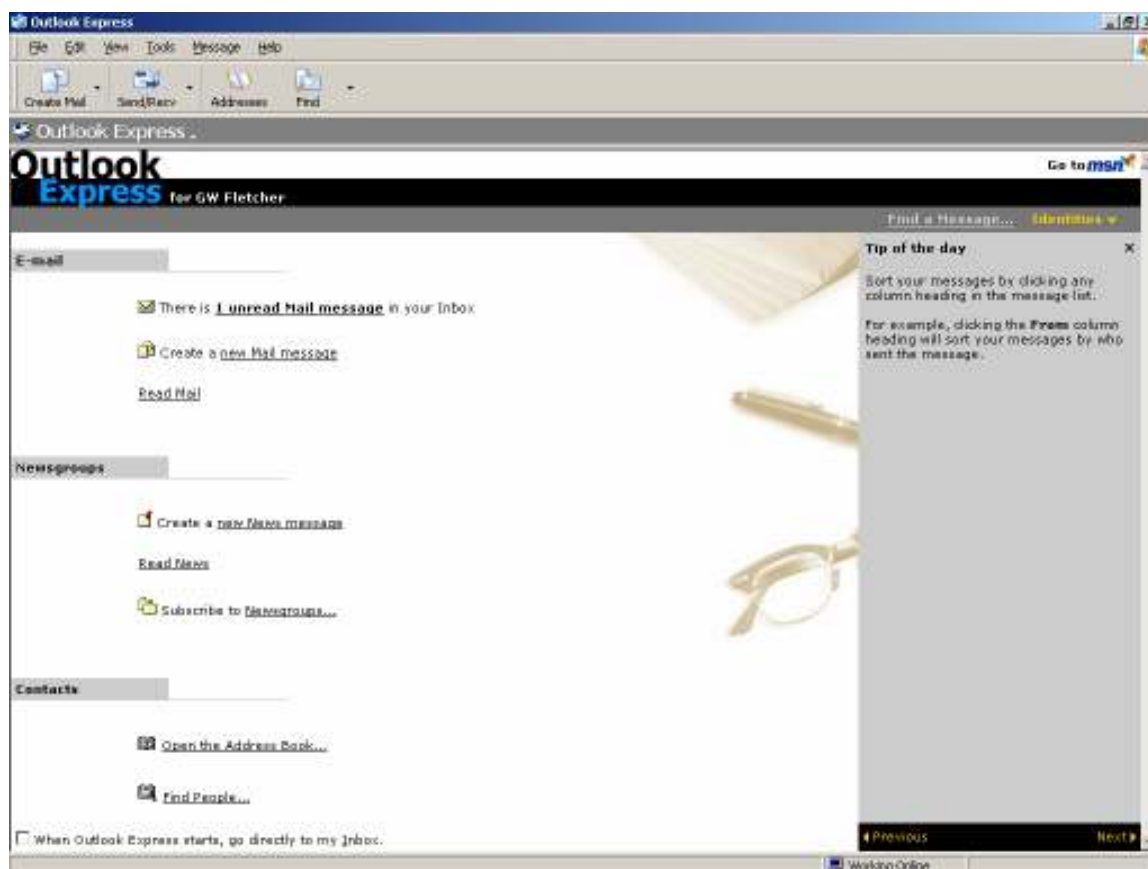
POP Server is pop.charter.net. SMTP Server is smtp.charter.net.

VERIZON

POP Server is incoming.verizon.net. SMTP is outgoing.verizon.net.

OUTLOOK EXPRESS

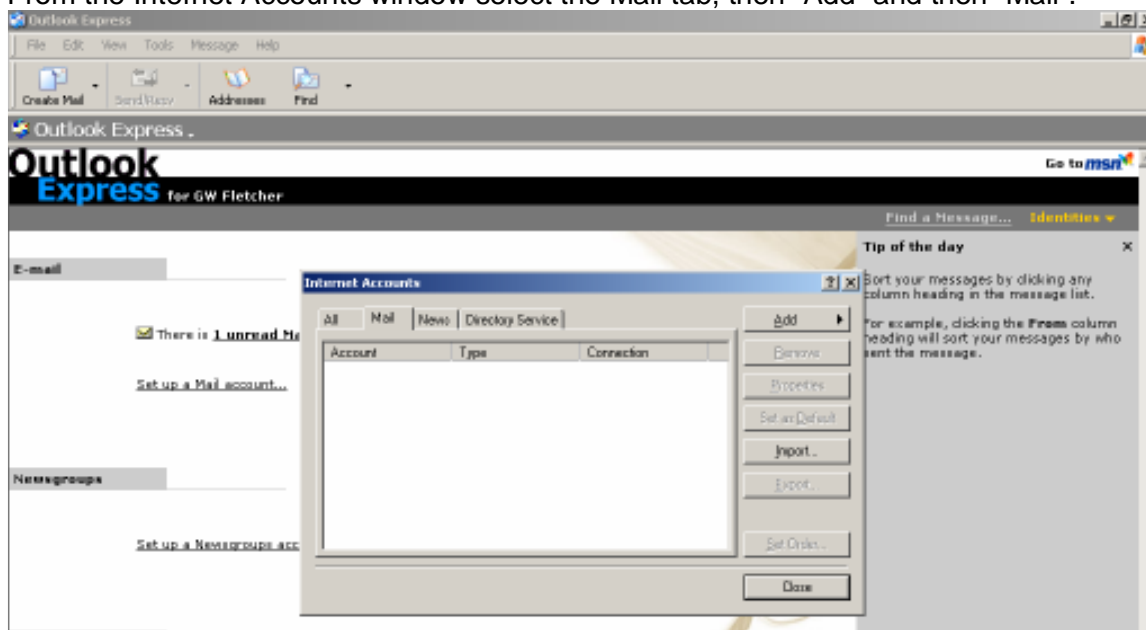
Microsoft provides Outlook with its Office Professional Suite of productivity software. This includes Word for word processing, Excel for spreadsheets, PowerPoint for presentations, Access for database applications and Outlook for email, contacts and scheduling. The Standard version of the Office Suite does not include Access and comes with a version of Outlook called Outlook Express. The interface and steps for account setup vary slightly between Outlook and Outlook Express.



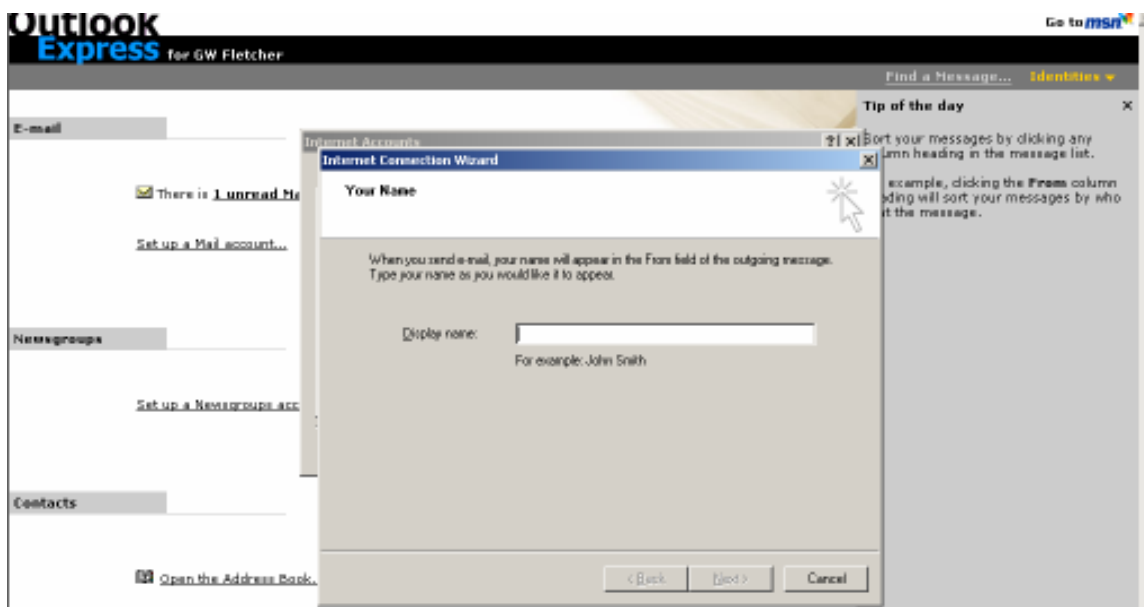
To set up Outlook Express to send/receive our email from our POP mail account, under the Tools tab, select Accounts



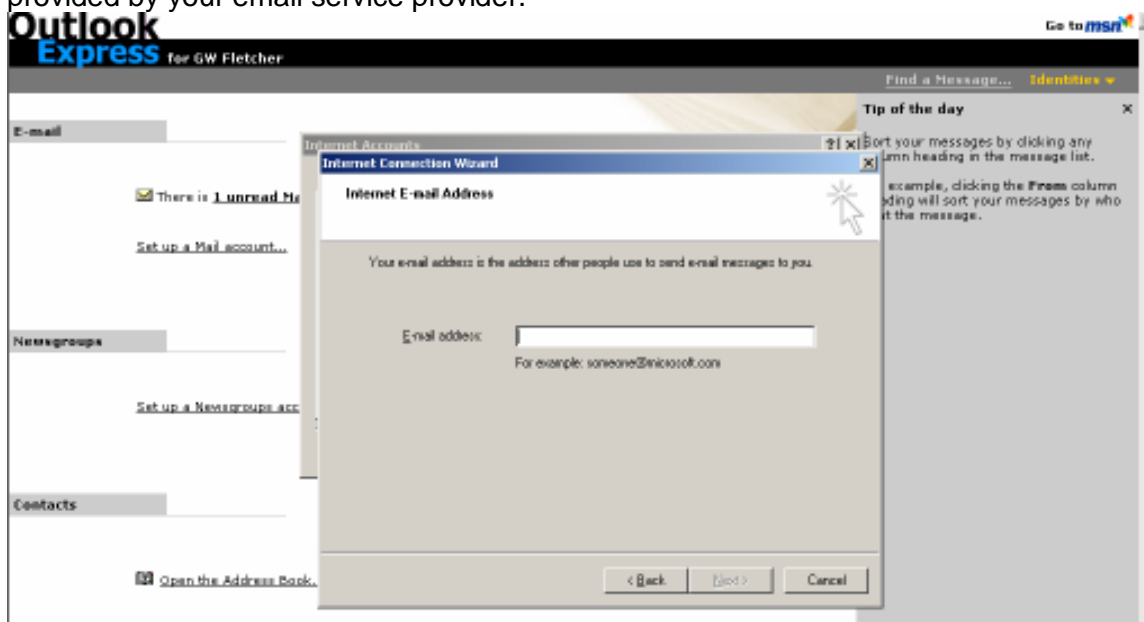
From the Internet Accounts window select the Mail tab, then “Add” and then “Mail”.



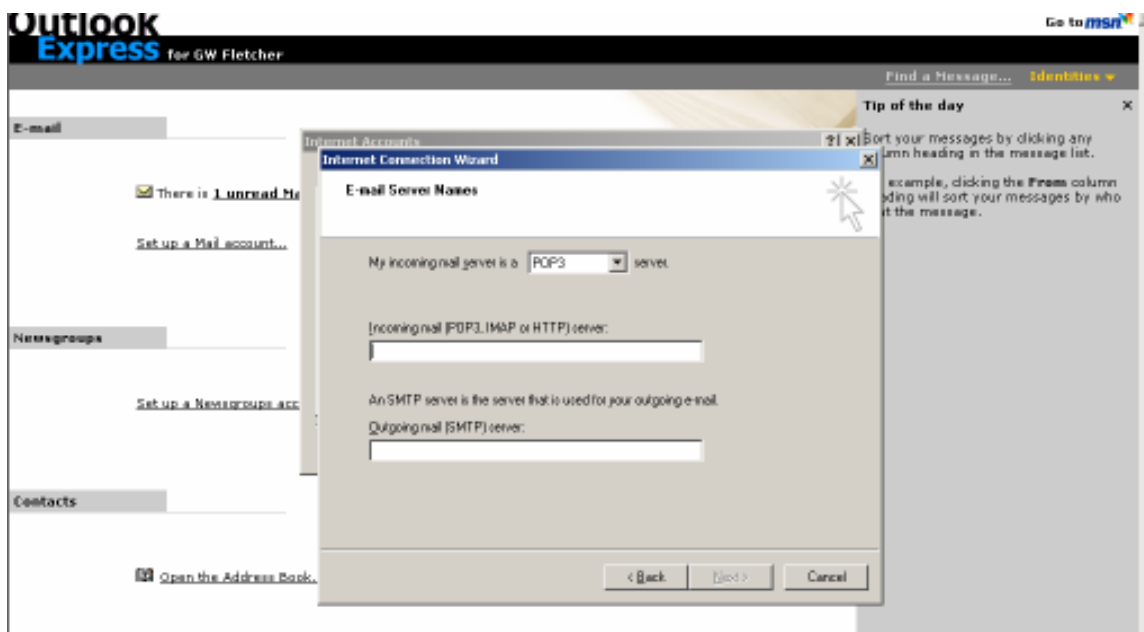
Outlook Express will then ask you to provide your “Display Name”. This is the name Outlook Express will use on your sent mail and what people who receive mail from will see as the sender name.



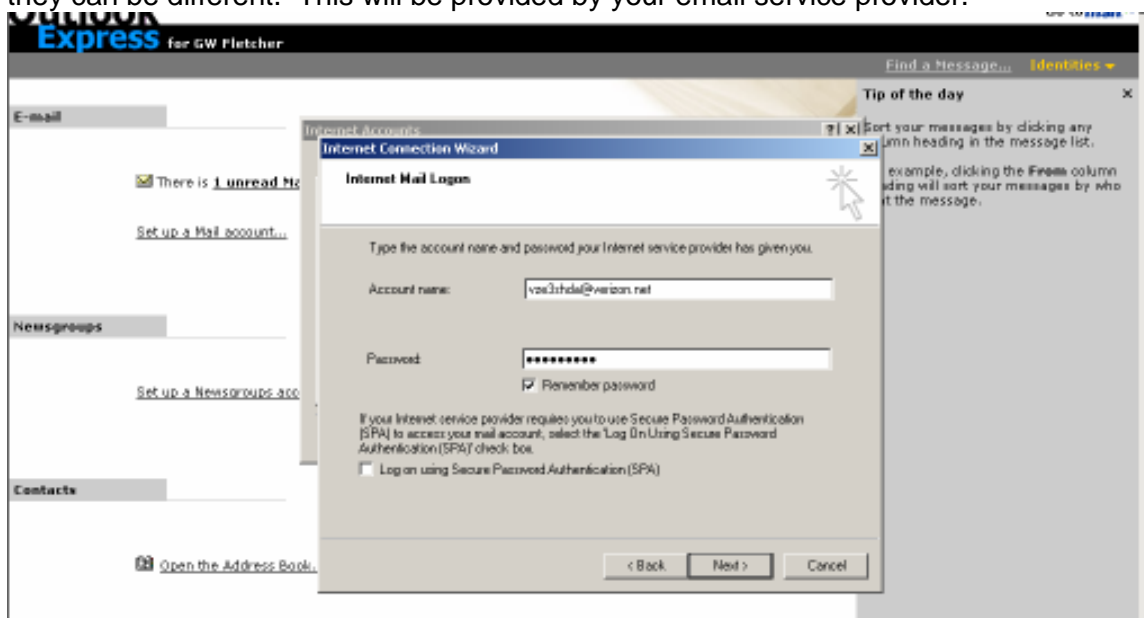
Next Outlook Express will ask for your email address. This is the email address provided by your email service provider.



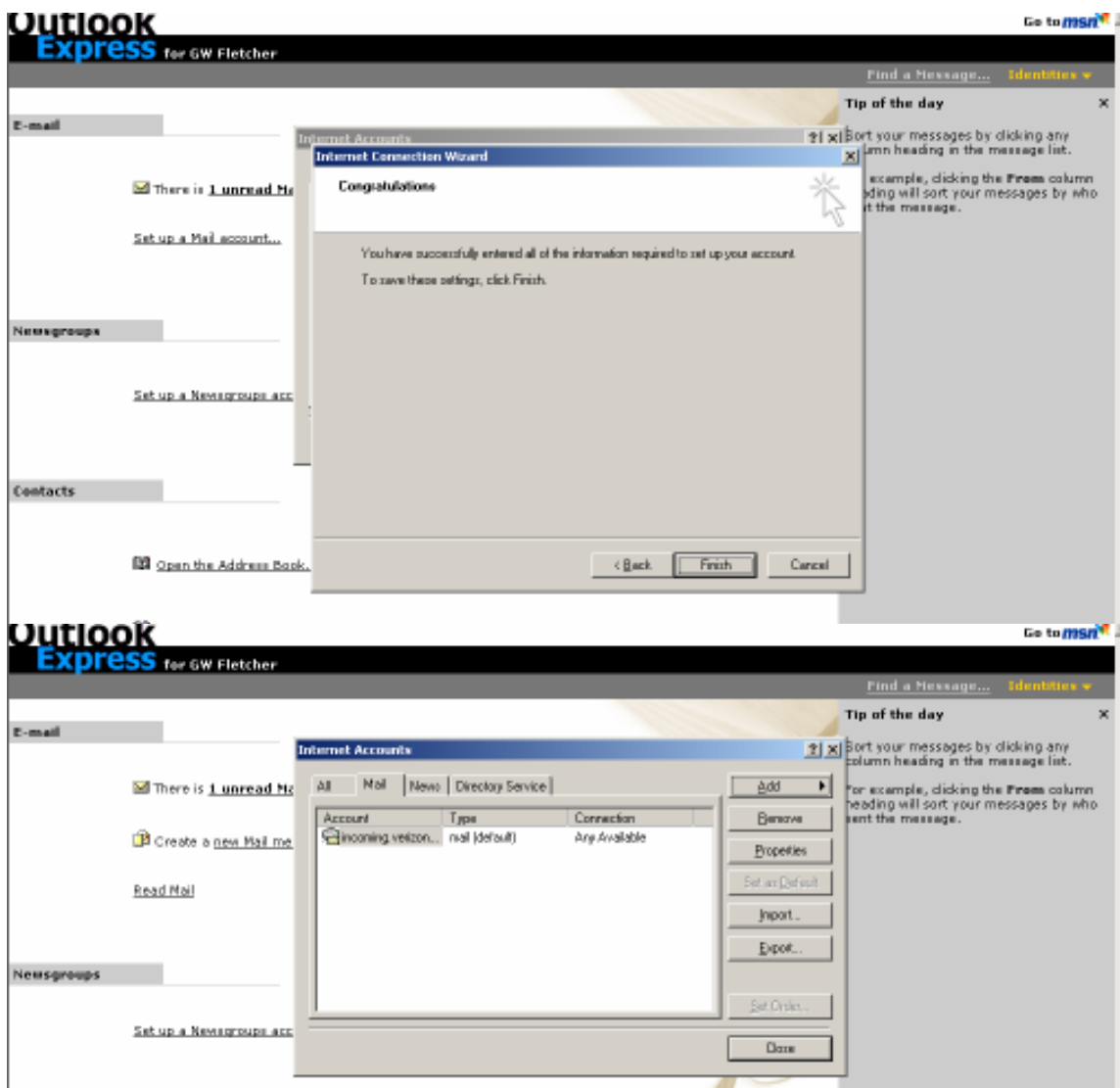
On the next window you will provide the POP and SMTP information necessary to send/receive your email.



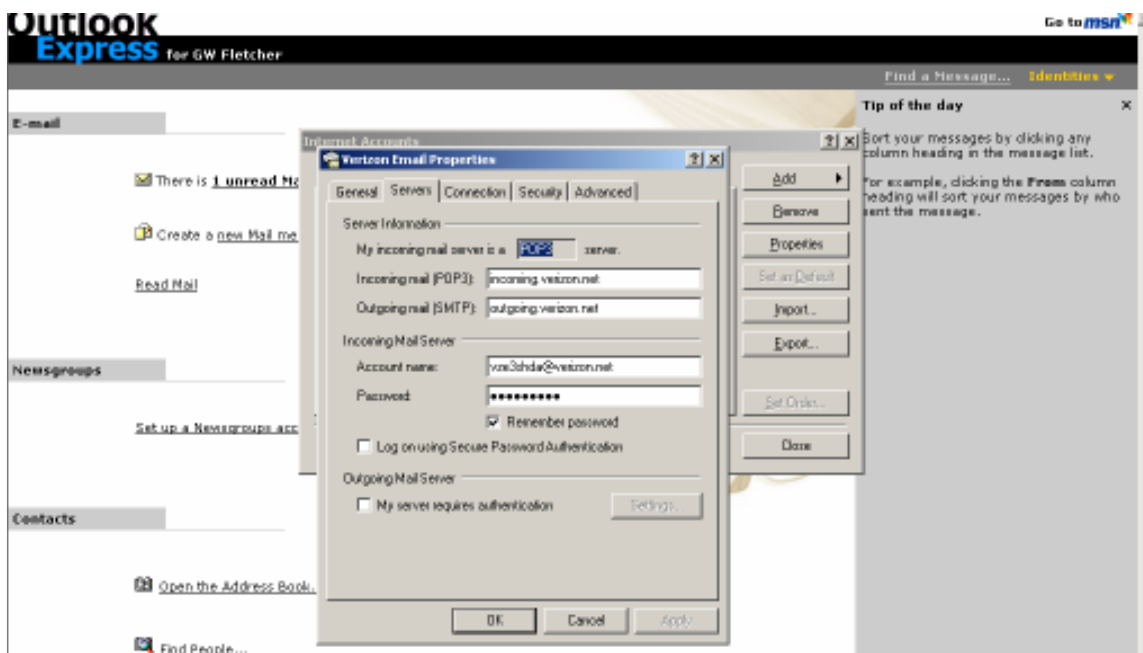
The next window is used to provide the logon information necessary to connect to your email service provider. Your account name and email address may be the same. Or, they can be different. This will be provided by your email service provider.



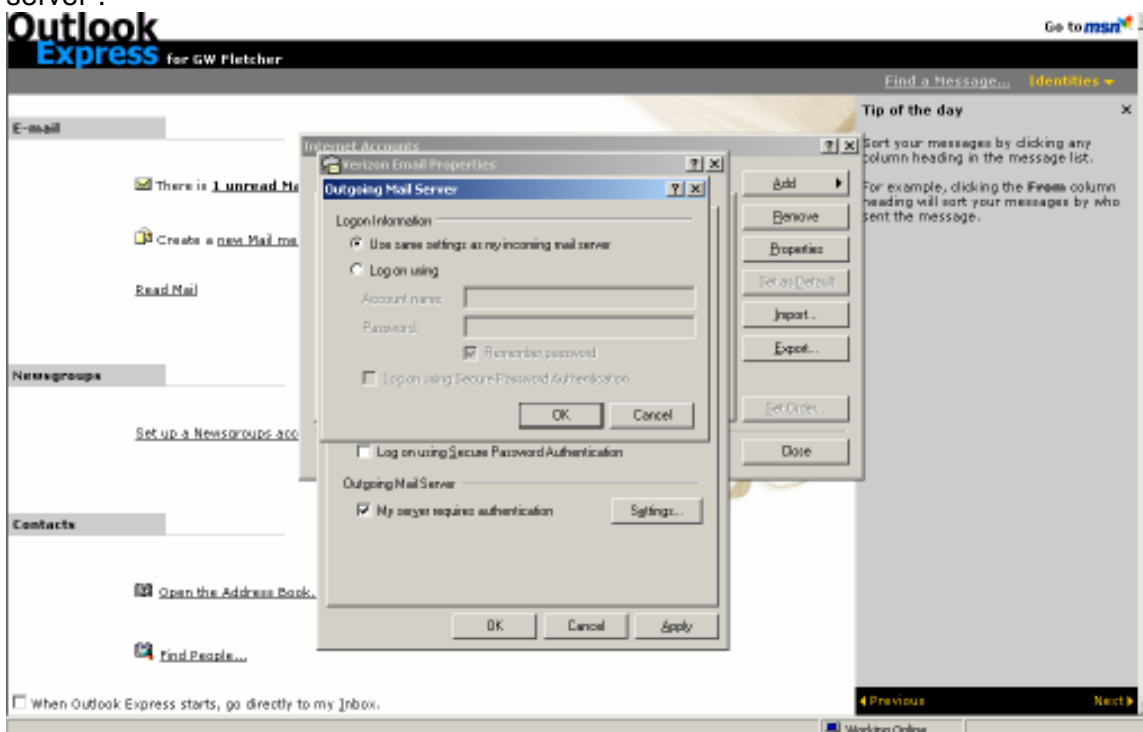
And then Outlook Express is configured to send/receive your email.



You should see the email account you just set up in the Internet Accounts Mail window. You can change the account by selecting "Properties" and you may want to change the name of the account from the name of the POP server to something more meaningful. You will also likely have to go under "Properties" to change the setting for your Outgoing Mail Server.



If necessary, and most email service providers will require you to do this, check “My server requires authentication” and then “Use same settings as my incoming mail server”.

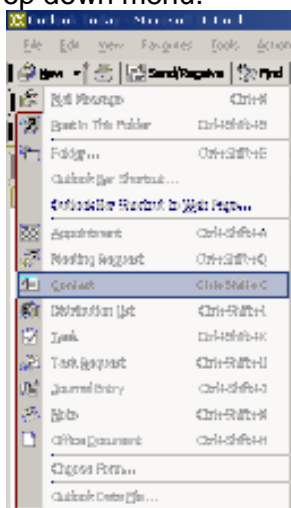


One last set up selection you may want to make is “When Outlook Express starts, go directly to my Inbox”.

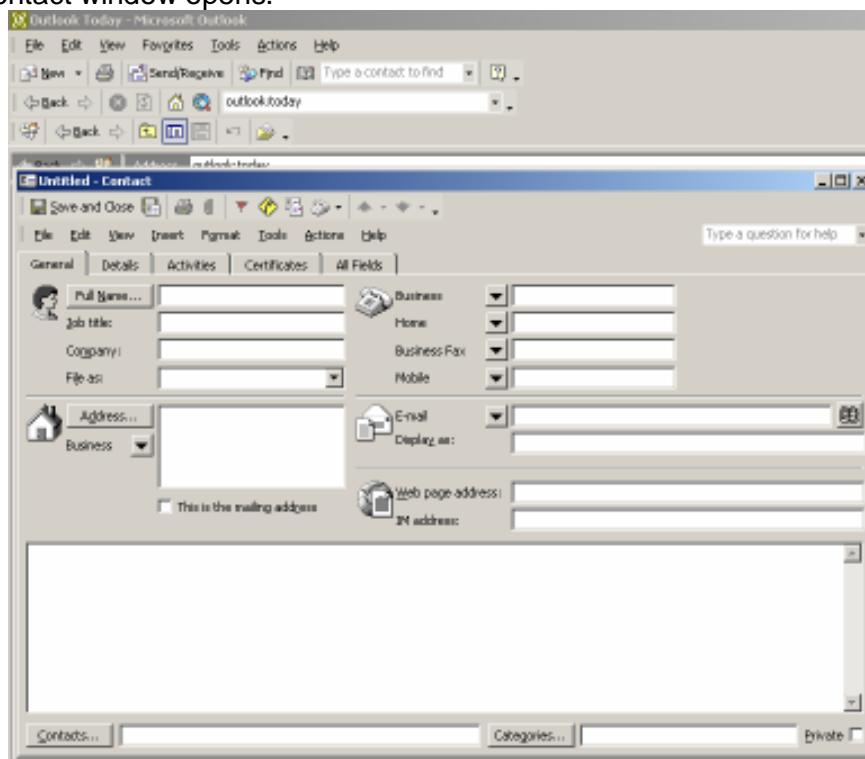
OUTLOOK CONTACTS

CREATING CONTACTS – OUTLOOK

Select Contact from the “New” drop down menu.



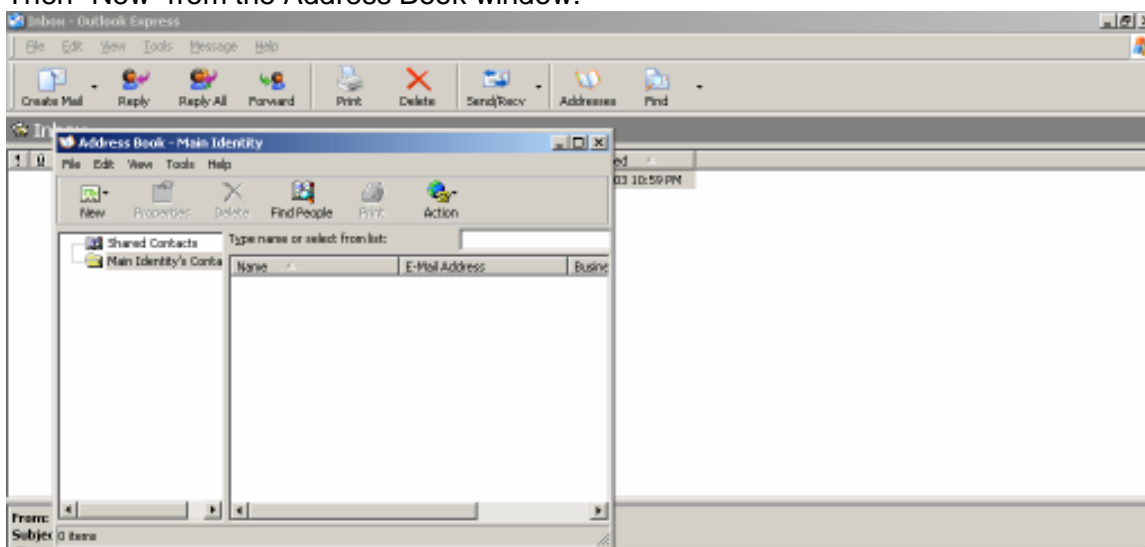
A blank Contact window opens.

*CREATING CONTACTS – OUTLOOK EXPRESS*

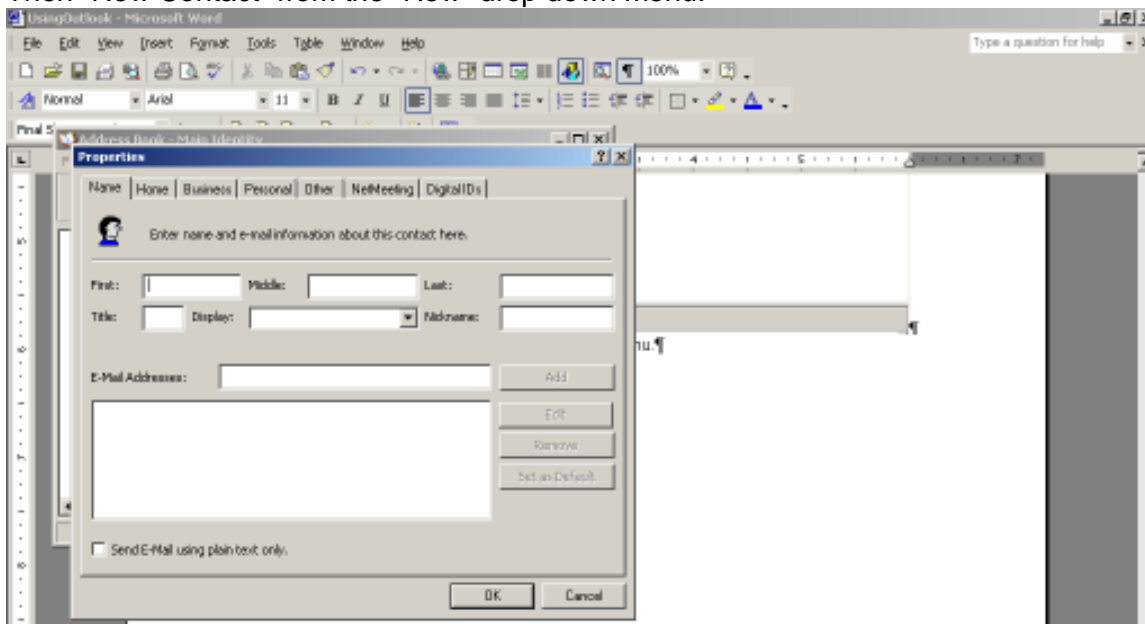
Select the Addresses icon.



Then “New” from the Address Book window.

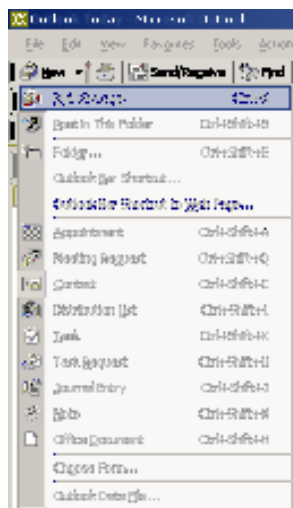


Then “New Contact” from the “New” drop down menu.

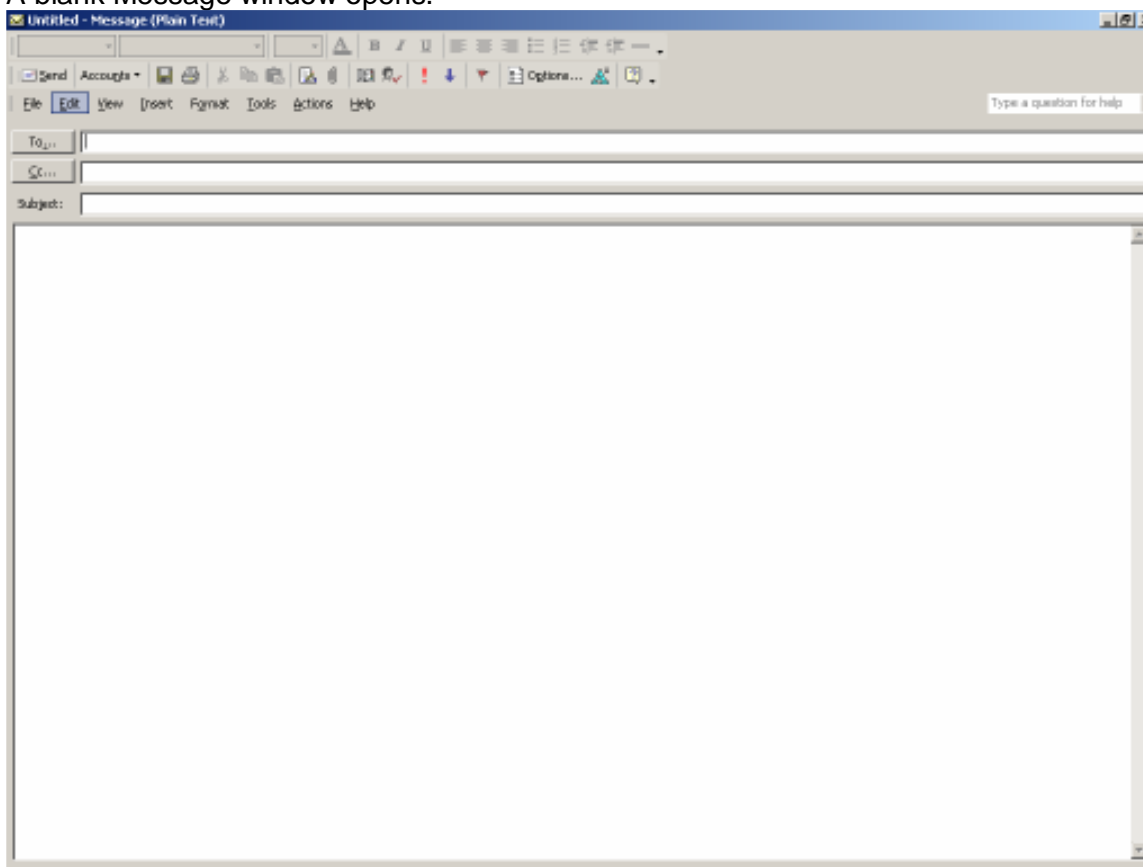


CREATING EMAIL – OUTLOOK

Select “Mail Message” from the “New” drop down menu.



A blank Message window opens.

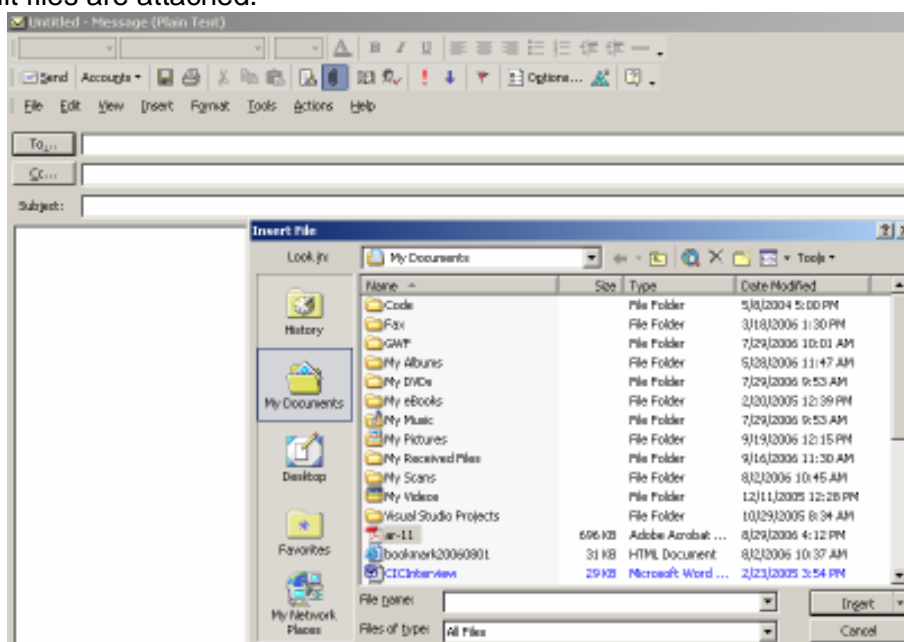


Click on either “To...” or “Cc...” to select recipients to receive your message, a copy of your message or a blind copy of your message. Optionally enter a “Subject” for your message and then type the content of your message.

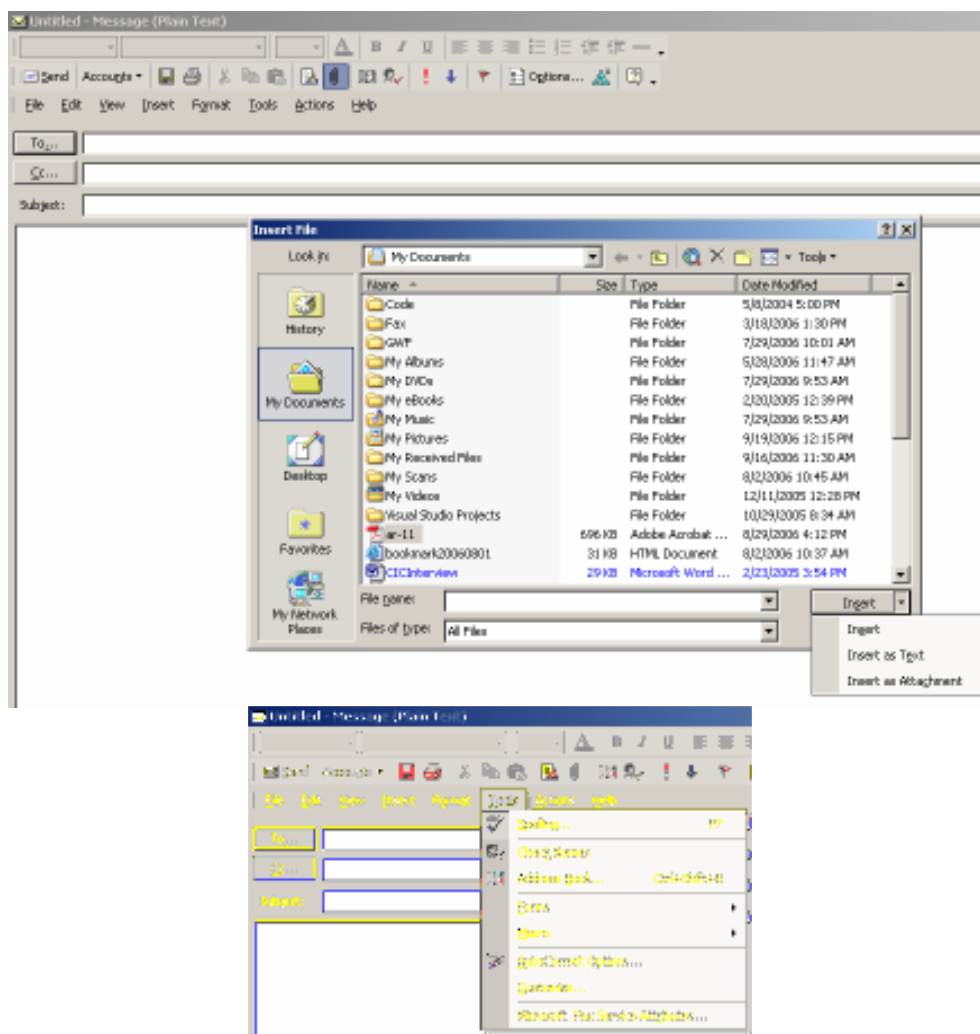
If you have created more than one email account you can select the account from which to send the email message from the “Accounts” button.

You can add a signature to the message if you have defined signatures (see Options).

You can attach or insert a file. A file can be “any” computer file such as a letter, a picture, a spreadsheet. Click the “paperclip” icon then select the file you want to attach. By default files are attached.



Some people you send files to may want you send attachments as text in the body of your email message. To do this click on the down-arrow next to the “Insert” button and select “Insert as Text”.



Under the Tools menu you will find “Spelling” which will perform a spell-check on your email message. The shortcut to this is F7. You can also set automatic spell-checking on under Options.

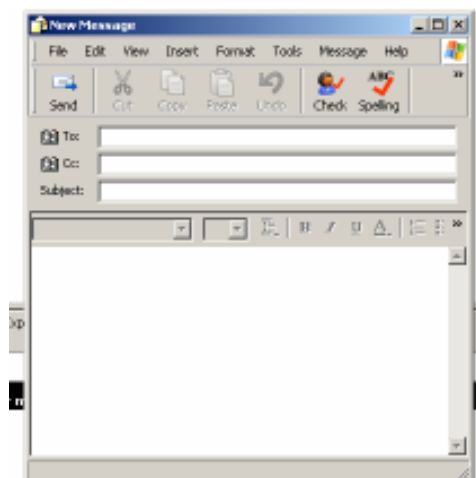
When you’re ready to send you click the “Send” button.

CREATING EMAIL – OUTLOOK EXPRESS

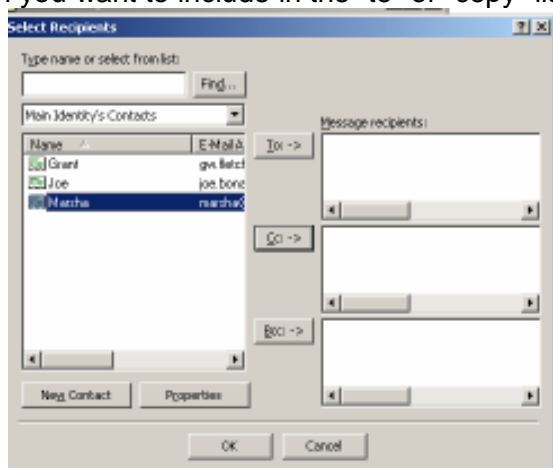
Select the “Create Mail” icon.



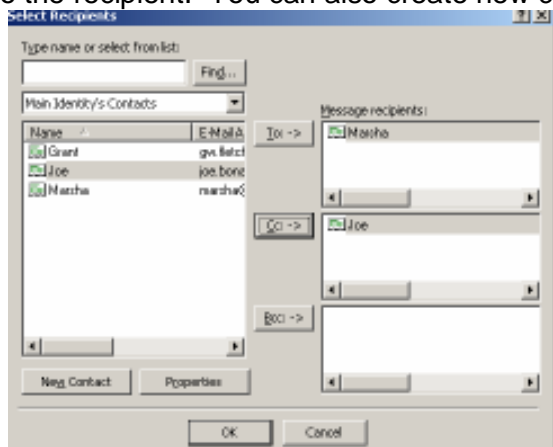
The “New Message” window opens.



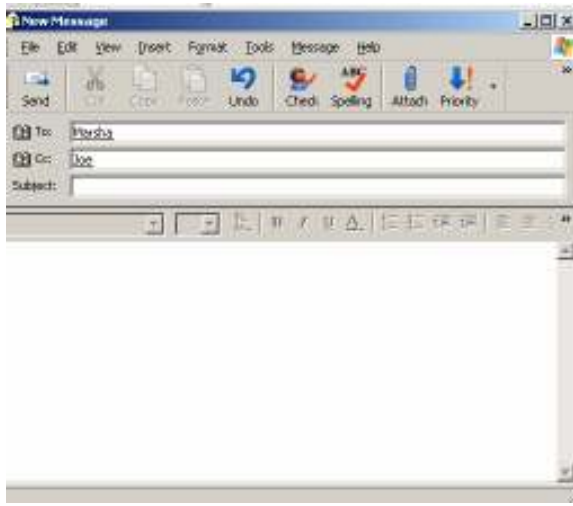
You can click on “To:” or “Cc:” to open your Address Book to select recipients. Click on the name of the person you want to include in the “to” or “copy” list.



Then click on the list on which you want them (“To”, “Cc” or “Bcc”). The blind copy (“Bcc”) list is not sent to the recipient. You can also create new contacts here.



Once you have selected your recipients and clicked “OK” the mail composition window opens.

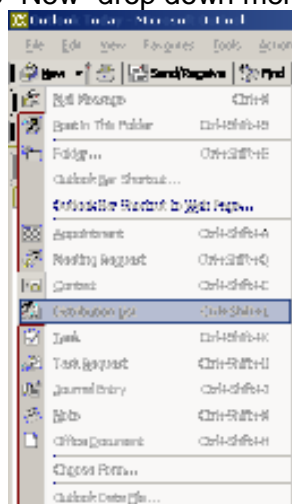


You can then enter the “Subject” of the email and the message. Click “Send” and the email will be sent to your SMTP server.

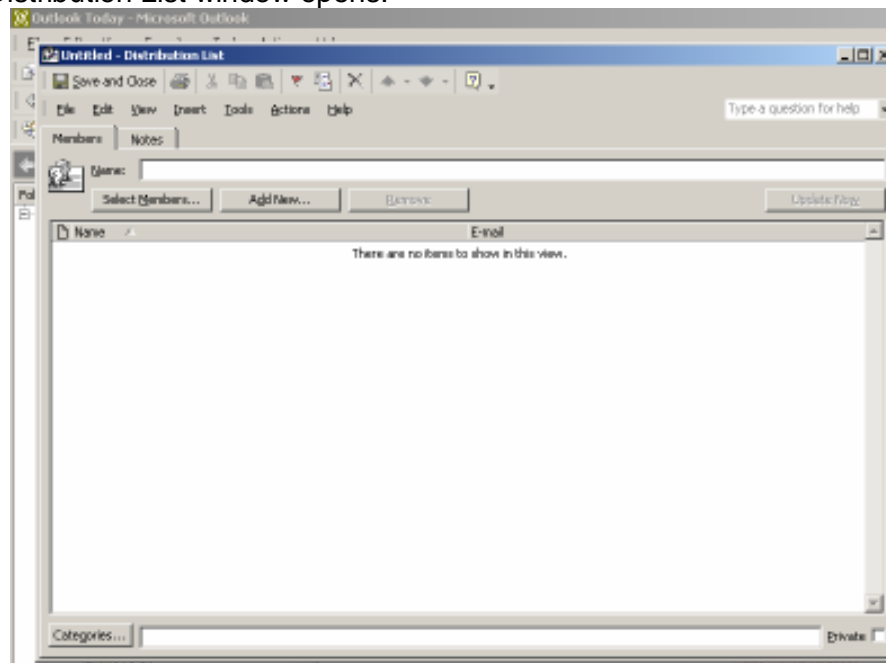
OUTLOOK GROUPS

CREATING DISTRIBUTION LIST / GROUPS – OUTLOOK

Select “Distribution List” from the “New” drop down menu.



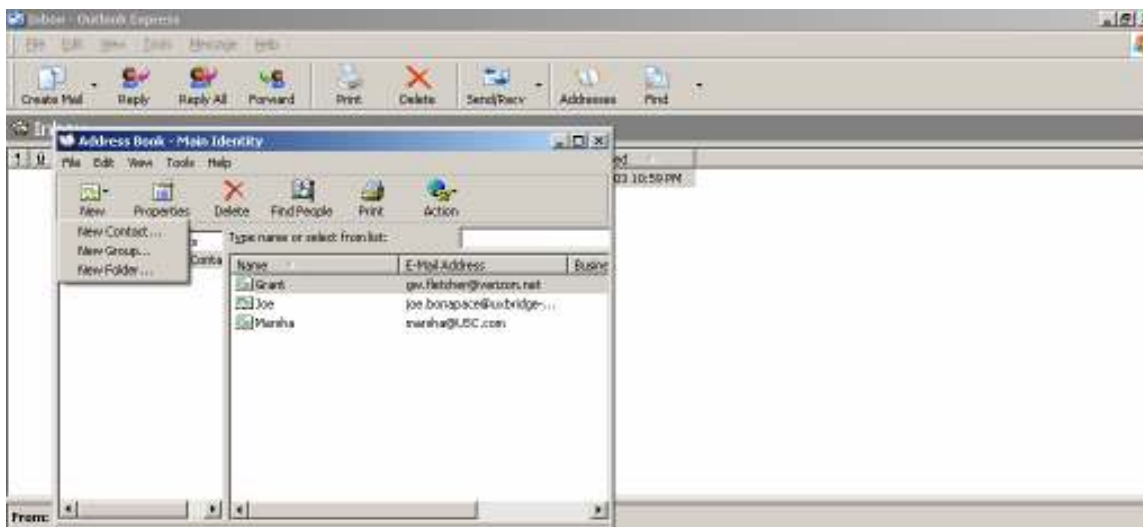
A blank Distribution List window opens.



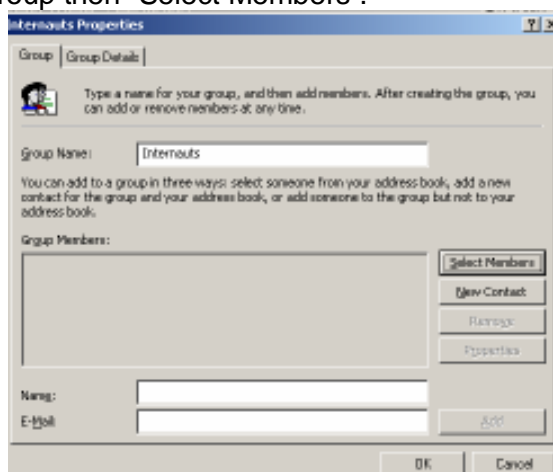
Select distribution list members from your Address Book or Add New to include someone on a distribution list who is not already in your Address Book.

CREATING GROUPS – OUTLOOK EXPRESS

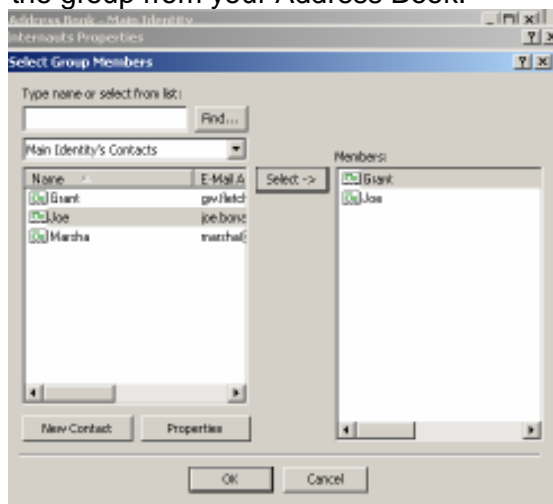
Select the Addresses icon, then “New Group” from the “New” drop down menu.



Type a name for the group then “Select Members”.



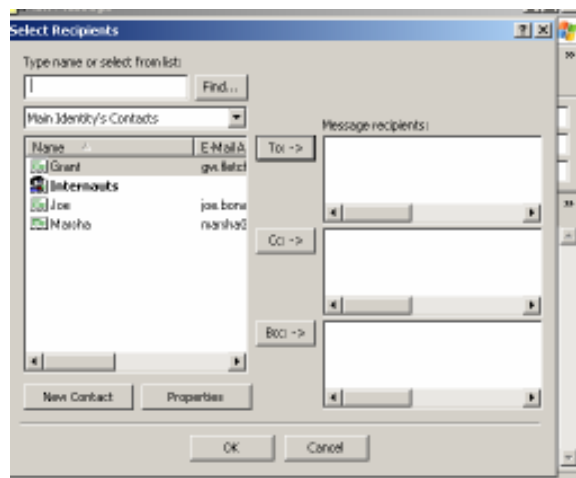
Select the members of the group from your Address Book.



You can also add someone to the group that is not already in your Address Book by entering the person's name and email address then “Add” on the previous window.

USING GROUPS – OUTLOOK EXPRESS

Whenever you select an entry from your Address Book the groups you have created will also be listed and can be used to include all the people in the group without individually selecting each name.

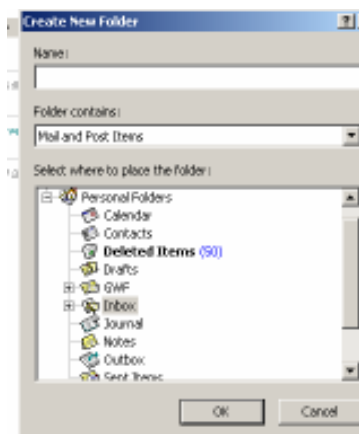


OUTLOOK FOLDERS

Outlook comes with some defined standard folders such as Inbox, Outbox, Sent Items, Deleted Items and Drafts. You can also create custom folders to help you manage your email. Right mouse click on the existing folder to which you want to add a subfolder.

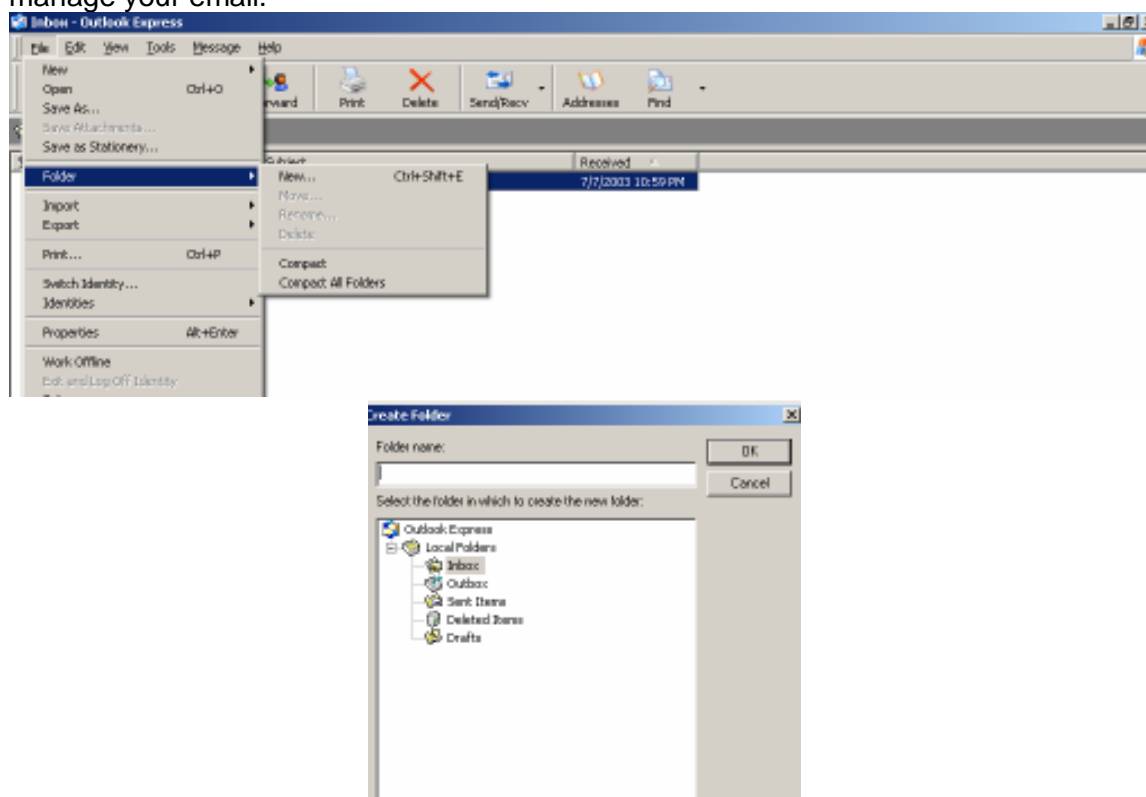


Then enter the name of the folder you want to create.

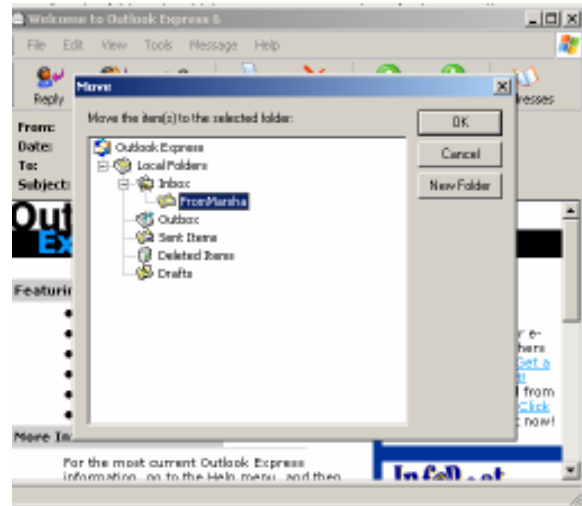
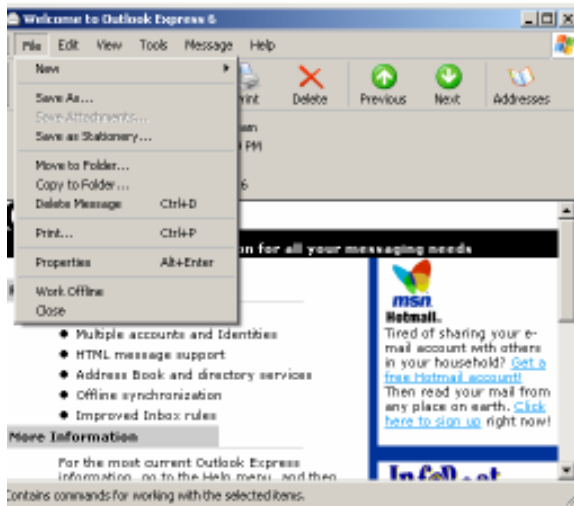


OUTLOOK EXPRESS

Outlook Express comes with some defined standard folders. They are Inbox, Outbox, Sent Items, Deleted Items and Drafts. You can also create custom folders to help you manage your email.



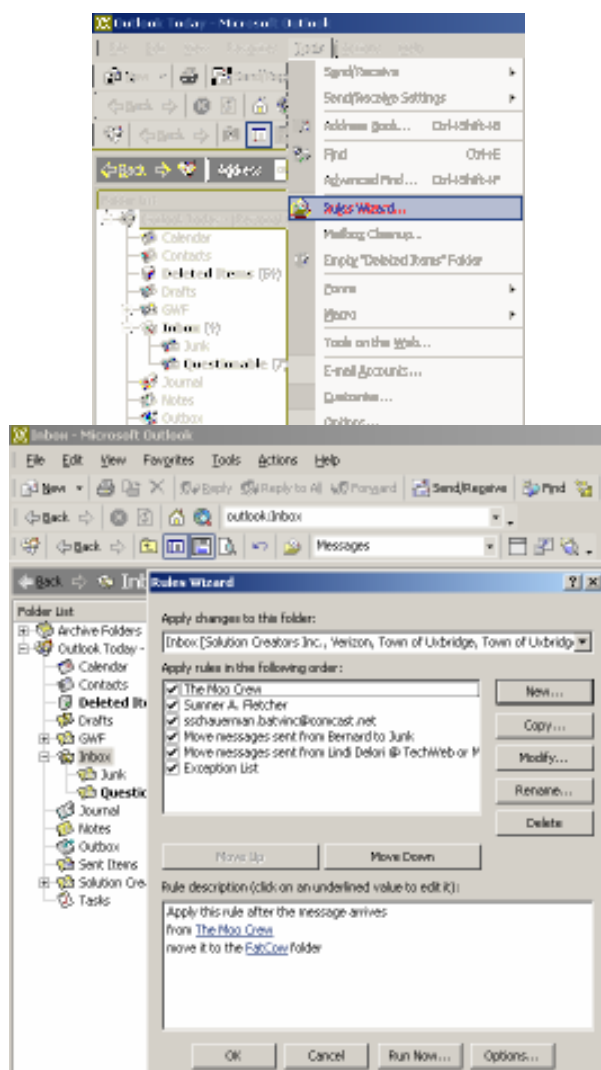
You can move email to the folders in which you want to store them for later reading instead of keeping them in your Inbox. When you an email open or selected, from the File menu select Move or Copy to Folder, then select the folder in which to store the message.



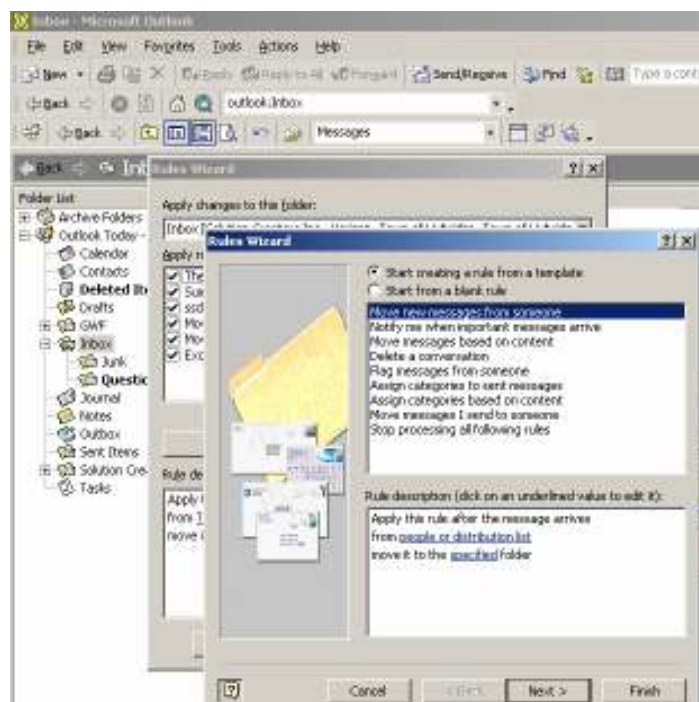
OUTLOOK RULES

RULES – OUTLOOK

From the Tools drop down menu select “Rules Wizard”. The Rules Wizard window opens.



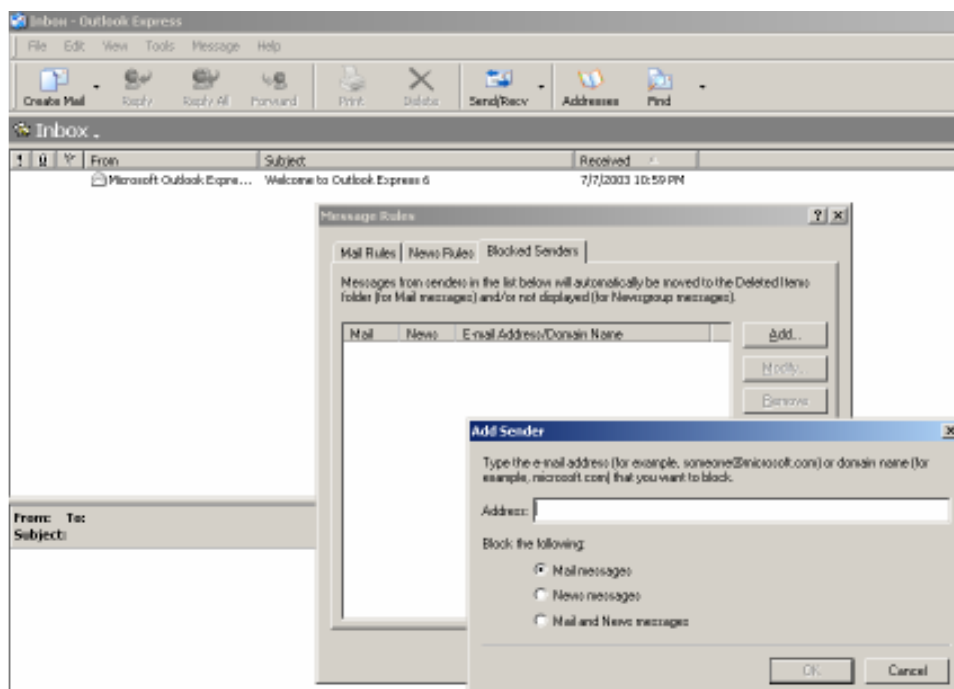
Rules are actions to take with email messages which meet defined conditions.



RULES – OUTLOOK EXPRESS

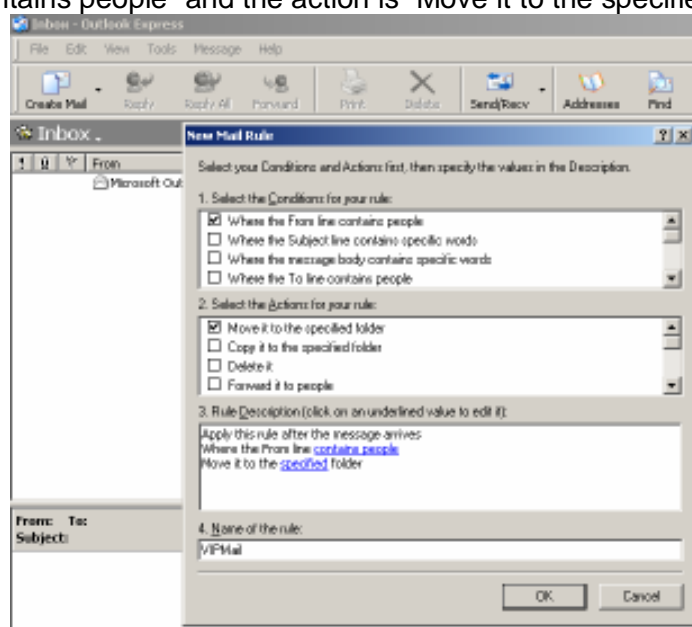
From the Tools drop down menu select “Message Rules”. You can create a list of email addresses from which to block all email.



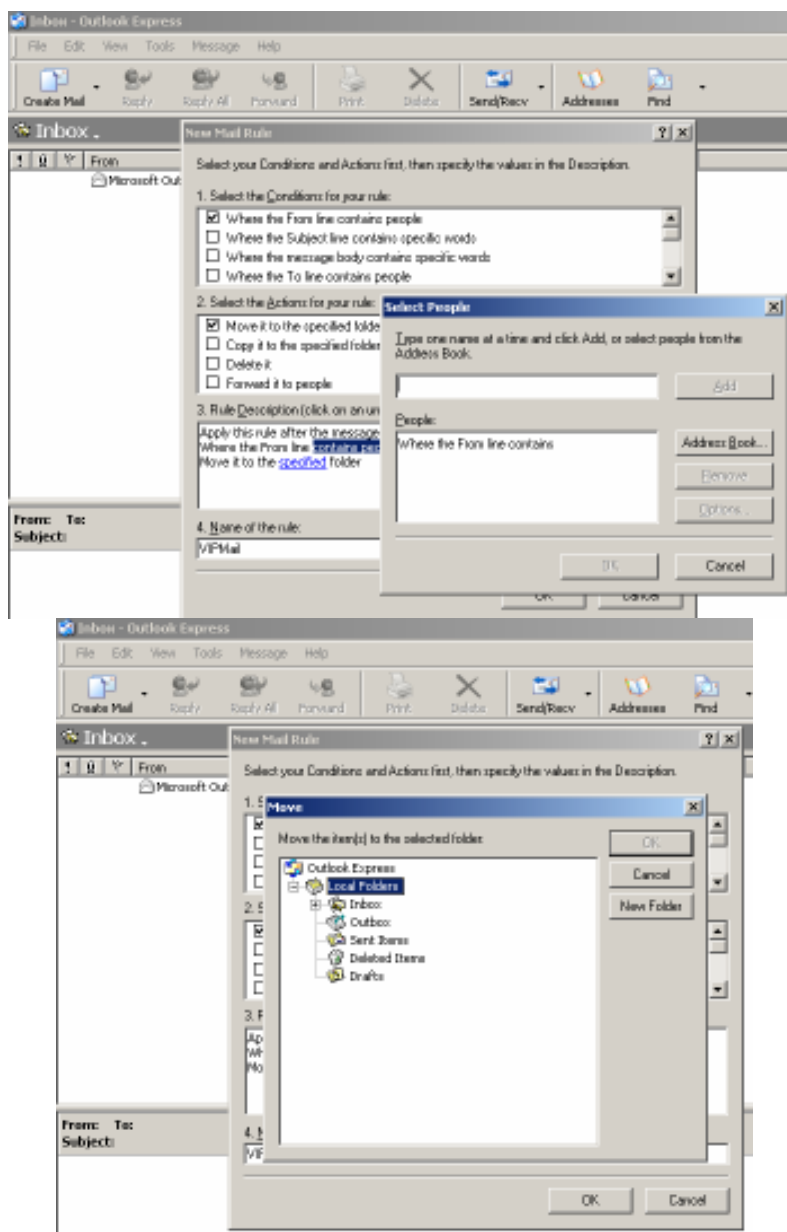


You can also create specific rules to handle email messages. When you create a rule you specify the conditions the email message must meet before the rule is applied, define the action to take with the email message and any parameter criteria that describes the rule.

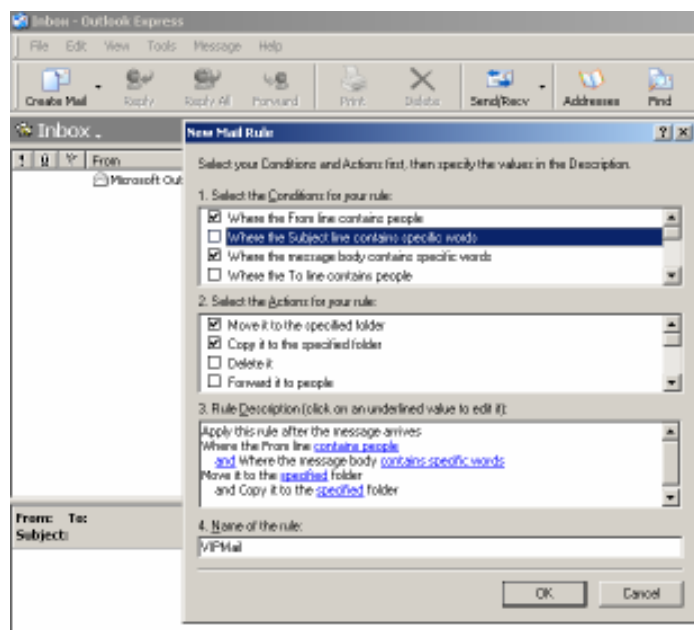
The example below is a rule called “VIPMail”. The condition that must be met is “Where the From line contains people” and the action is “Move it to the specified folder”.



The parameters, people in the from line and the target folder, are defined by clicking the links in the Rule Description section of the Rule window.



Rules can have more than one condition and more than one action. In this case the definition is more complex.

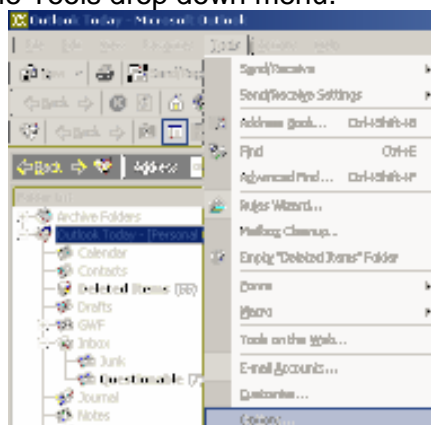


A suggestion to help you deal with spam and other unwanted email is to create a rule “Where the From line contains people” – include the people you frequently get email from whom you want to read and “Move it to the specified folder” – create a special folder for this email. Then whatever is in your Inbox is mostly less important email or email you are going to want to delete.

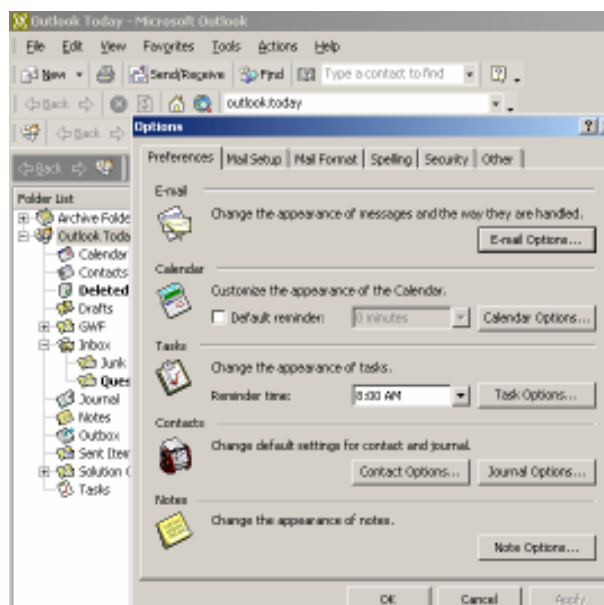
OUTLOOK OPTIONS

OPTIONS – OUTLOOK

Options are defined from the Tools drop down menu.

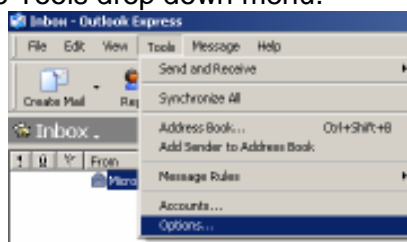


The Options window opens.

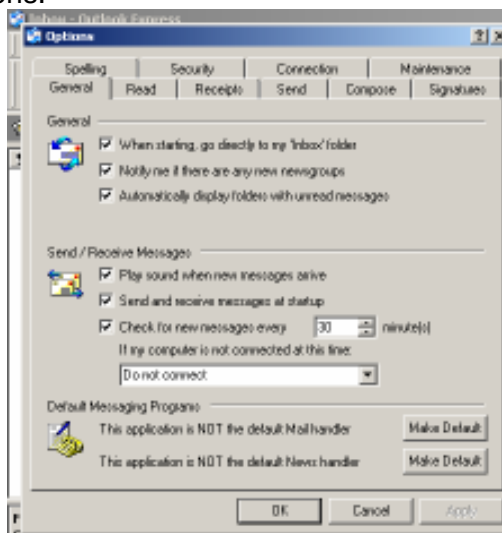


OPTIONS– OUTLOOK EXPRESS

Options are defined from the Tools drop down menu.



The Options window opens.



The tabs across the top provide access to more options.

